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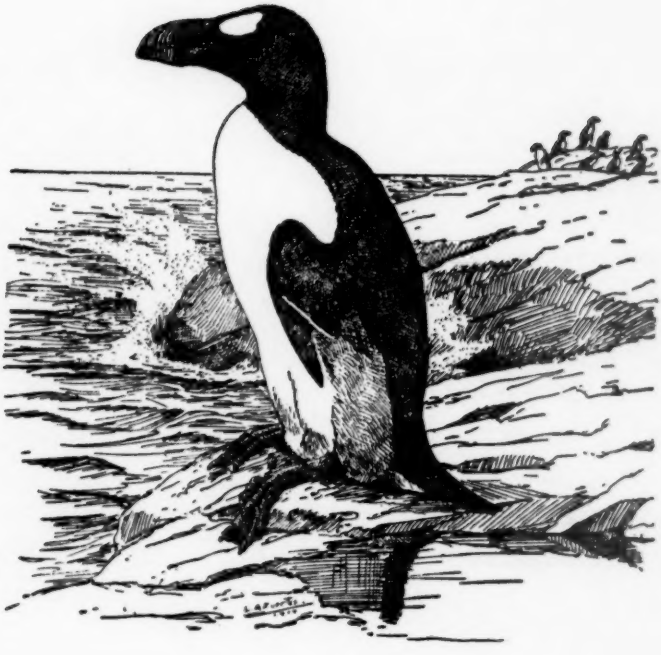

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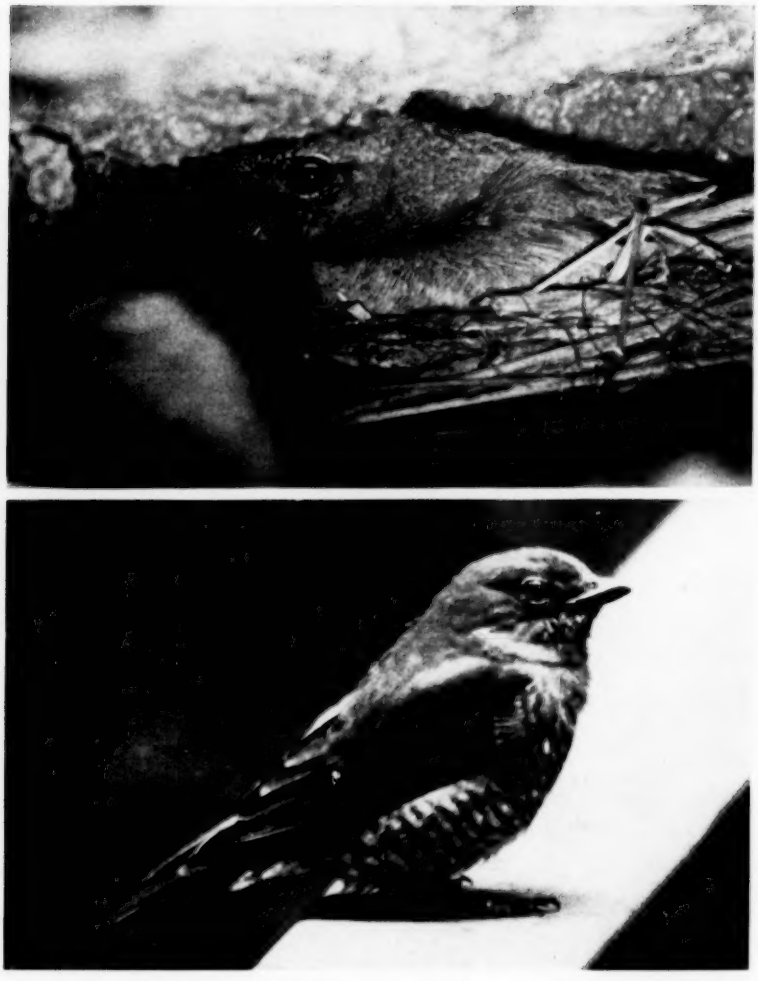

SWALLOW-TANAGERS (*Tersina viridis*). (*Top*) FEMALE THREE INCUBATING, TWO METERS INSIDE NESTING HOLE. (*Bottom*) FEMALE TWO. PHOTOGRAPHS BY K. KOCH.

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ORNITHOLOGY

VOL. 70 OCTOBER, 1953 NO. 4

CONTRIBUTION TO THE LIFE HISTORY OF THE SWALLOW-TANAGER

BY ERNST SCHAEFER

THIS paper is intended to fill some of the gaps in our knowledge of one of the most fascinating South American birds, the Swallow-Tanager or Azulejo Golondrina (*Tersina viridis*).

The stimulus to deal with *Tersina viridis* I thankfully owe to Dr. Frederick Test of the University of Michigan. He and Mrs. Test were the first visiting scientists from the United States to the newly founded Estación Biológica de Rancho Grande in the state of Aragua, northern Venezuela. I wish especially to express my most cordial thanks to Dr. Armando Tamayo, Ministro de Agricultura y Cria (MAC), who made my work in Venezuela possible, and to Dr. Tobias Lasser, Director Forestal, who, as one of the most active promoters of modern science in Venezuela, is the actual founder of the Estación Biológica. I am also very much indebted to Dr. William Phelps and Mr. William Phelps, Jr., of Caracas, who have at all times extended to me their most generous help and encouragement; and to Mr. Guido Steinvorth and Miss Nadine Huang for facilitating the writing of this manuscript. Furthermore, I am indebted to Dr. Guillermo Zuloaga of the Creole Petroleum Corporation. Last but not least, I owe much to my co-workers, especially to my young Venezuelan friend Julio Moreno, who with great devotion, skill, and patience, has been my most helpful associate in the field during our three months of almost continuous observations from daybreak to dusk; and also to Willy Tille, Wolfram Bleuel, and José Perez, who have given their valuable assistance. The meteorological data were compiled by José García, and many of the photographs reproduced in this paper were taken by Konrad Koch.

The Parque Nacional de Rancho Grande, where these studies were made, extends from the inland basin of Lake Valencia at an elevation of 450 meters, across the peaks of the Cordillera de la Costa (2,400

meters high) to the rocky coast of the Caribbean Sea. Biodynamically and ecologically it can be divided into three main belts: the Tropical (0 to 800 meters), the Subtropical (800 to 1,800 meters), and the "Subtropical-temperate" (1,800 to 2,400 m.), each with its own very characteristic flora and fauna (Schäfer, Journ. für Ornith., 93: 313–352, 1952). The region is extremely rich in bird life. During the two and one-half years since the establishment of the Estación Biológica, more than 450 species of birds have been recorded in this comparatively small area comprising only about 9,000 hectares.

The tersinas comprise a very small, monotypic, purely South American group of passerine birds, which is considerably specialized in structure and habits. The form on which the following observations were made is *Tersina viridis occidentalis* (Sclater).

Although the bird occupies a prominent position in the avifauna of Venezuela and the Parque Nacional, very little is known of its habits. This is especially true of its mode of reproduction, as its nests are always concealed in natural or artificial holes and burrows. As is the case in many species of uncertain taxonomic relationships, this purely biological study may be helpful in clarifying the systematic position of *Tersina*.

Appearance and Identification Marks.—Tersina viridis is one of the most gorgeously colored species of the entire Neotropical Region. It is characterized by a very pronounced sexual dimorphism. The main field identification marks of the male are: nearly entire body turquoise blue, if seen against the light in bright sunshine, but changing to emerald green when seen with the light. Forehead, sides of head and especially throat, deep velvet-black and center of abdomen pure white, forming a sharp wedge; sides of belly with black stripes and light edgings. The general color of the female is a bright green (not as iridescent as the male). The throat is grayish, and the abdomen is yellowish with green instead of black stripes. The plumage of the juvenile birds is much like that of the female, but duller.

There is great individual variation according to age in both sexes. The males especially show all transitional stages between juvenile green without facial masks and adult turquoise blue with deep velvet-black masks. The individual females may also be recognized in the field by careful observation as they often show different shades of green and gray on the throat. As with the males, the darker, more bluish females seem to be the older ones. Old birds of both sexes show a very distinct red reflection in the eye, missing in the younger birds which have brownish-gray irides. Males breed in their first year.

According to my observations, including "types" of individual behavior, it may well be that the fully adult male plumage is acquired

only after three or even four years. The variations in plumage lead me to postulate this sequence of plumages for the males:

One year old—mottled green and blue; no facial mask.

Two years old—bluish-gray with green feathers on abdomen; facial mask dark gray, "pepper and salt."

Three years old—blue with grayish shade; black facial mask well developed but still dull.

Four years or older—brilliant blue, strongly contrasting with white waist-coat and deep, shiny velvet-black mask. Red eye.

This great individual variation together with the already-mentioned sexual dimorphism makes it easy to recognize most individual birds without the help of color banding. Nevertheless, twelve were banded during the nesting period of 1952.

Weight.—Males and females are of nearly the same weight, varying between 29 and 35 grams, according to season and state of nutrition. Females as a rule are very fat before the breeding season. A pair collected on March 23 showed marked differences in weight: male (lean, testes enlarged), 30 gm.; female (very fat), 35 gm. Two young captive males weighed: 50 days old, 25 and 26 gm., respectively; 100 days old, 28 and 29 gm., respectively.

Anatomical Peculiarities.—The flat, broad, swallow-like bill of *Tersina*, with its sharp edges and a pronounced hook on the maxilla, together with the proximally placed cone-shaped nostrils, is an ideal instrument not only for catching flying insects and holding, cutting, and swallowing big, pulpy fruit with hard peels, but also for excavating holes.

The throat of *Tersina viridis* forms an elastic pouch of great capacity, and the whole esophagus, especially in young birds, is lined with pronounced longitudinal folds, 2 to 3 cm. long, which make it capable of sac-like extension. A crop is missing, and the stomach is very muscular but relatively small (± 1.5 cm. long, ± 1 cm. broad, and ± 0.5 cm. high).

Undoubtedly these anatomical peculiarities have a certain adaptive value in the life of the species as will be described later. It also may be noted here that in two adult males I found the right testis much larger than the left one.

Geographical Distribution.—According to Phelps, *Tersina viridis occidentalis* is widely distributed. It ranges from northwestern Brazil, British and French Guiana, the Isle of Trinidad, Bolivia, Peru, and Colombia, up to Panama. Its local and seasonal distribution in Venezuela in general, and the Parque Nacional in particular, is extremely interesting. Like many other passerine birds, *Tersina viridis* is not sedentary but semi-migratory.

During the breeding season (February to August), in the broadest sense of the word, *Tersina viridis* seems to be confined to hilly or mountainous areas. This seems to apply not only to the northern mountains, the main Andes (states of Táchira, Mérida, Trujillo), but also to the coast range (Cordillera de la Costa), the Perijá Mountains on the Colombian border, and the vast mountainous regions south of the Llanos and the Orinoco River.

It is remarkable that, out of the 58 specimens in the Phelps Collection, 42 were collected between February and August and only 16 during the rest of the year.

In the Parque Nacional de Rancho Grande, *Tersina viridis* arrives in February, stays till August, and is completely absent from September to February. During three years of nearly continuous observation the following dates were compiled:

	First noted arrival		*Last noted departure*	
Year	*at ±500 m.*	*at ±1000 m.*	*at ±1000 m.*	*at ±500 m.*
1950	Feb. 25	March 8	July 20	Aug. 23
1951	Feb. 26	March 5	July 15	Aug. 22
1952	Feb. 14	Feb. 17	July 16	July 20

During their migration, the tersinas apparently do not follow the Cordillera de la Costa, but use the transverse valley to reach their breeding grounds. The only observation in flat tropical country was made on February 11, 1952, near Turmero (about 480 m. elevation) in the Aragua Valley, when an adult male flew northward over cultivated ground toward the Cordillera. Three days later the first birds arrived in the Parque Nacional.

Although until now it has been impossible to say anything conclusive about the migration routes of *Tersina viridis*, the material in the Phelps Collection gives us some hints. If we exclude the 42 specimens taken during the breeding season, and also eliminate three specimens which were possibly still migrating: a male and a female from Hacienda Altamira, 1,200 m. (state of Carabobo), and one male from Acarigua, 300 m. (state of Portuguesa), all collected in September, we find that the rest of the 13 tersinas were collected in the non-breeding season between October and January, and came from the humid "pocket" between the main Andes of Táchira and Mérida and the Perijá Mountains south of Lake Maracaibo, Rio Caura (state of Bolivar), all belonging to the great "hylaea" with its rather uniform hot and humid climate. Twelve of these 13 birds were taken at low altitudes between 100 and 400 meters, and only one specimen came from 700 m. (Seboruco, November 20), whereas the breeding grounds

(*Left*) MALE ONE SINGING ON HIS LOOK-OUT IN AVOCADO TREE. PHOTOGRAPH BY K. KOCH. (*Right*) SECOND GROWTH BETWEEN TERRITORIES ONE AND TWO. NEST-BUILDING MATERIAL WAS COLLECTED HERE. PHOTOGRAPH BY E. SCHAEFER.

in the Cordillera de la Costa range up to 1,800 m. (Colonia Tovar). Therefore, it might be assumed that *Tersina viridis* is a "hygrophil" species spending the dryer and cooler part of the year in the more humid parts of the country at rather low elevations.

Also, it seems most likely that the migration route of at least the tersina population of the Parque Nacional is in a north-south direction. It is interesting to note that in the Parque Nacional the population of *Tersina viridis* is almost entirely restricted to the south side of the Cordillera. On the northern slopes no tersina was observed below 800 meters. This fact is the more curious as the northern slopes are, especially during the dry season, much more humid than the southern ones and, at least from our human point of view, might therefore be considered as adequate wintering quarters. This, however, is apparently not the case.

Habitat.—Originally, *Tersina viridis* was undoubtedly a tropical bird. Compared with most of the other passerine species of the Parque Nacional, it has an unusually wide altitudinal distribution, ranging from the southern foothills of the Cordillera up to the building of the Estación Biológica itself (1,090 m.).

Tersina is not found in the widely distributed secondary savannas which cover the lower slopes towards the great alluvial plains of Lake Valencia. It is strictly a woodland species. The lower limit of its range is in the deciduous forests characterized by dense evergreen underbrush and widely scattered, often thorny, trees (*Hura crepitans*) the majority of which shed their leaves during the dry season.

At about 800 meters these deciduous seasonal forests merge insensibly into the semi-evergreen forests where only one-third of the trees shed their leaves during the dry season. The part-evergreen forest is characterized by an overwhelming growth of creepers and lianas, which cover nearly all the tree-tops in unbelievably thick masses. Here, between 800 and 900 meters, we found the optimum habitat for *Tersina viridis* in the Parque Nacional.

At approximately 900 meters, the part-evergreen forest merges with the evergreen montane cloud forest of the subtropical belt. Here, close to the watershed, the Estación Biológica lies at 1,090 meters above sea level. The half-ruined building lies in the middle of an ecological island of secondary growth, partly introduced and twenty years old. A high percentage of the bird population of this semi-xerophytic ecological island consists of aggressive invaders from the lower tropical belt. Only about half of the species belong to the subtropical cloud forest biocoenosis (rich in species but poor in numbers of individuals).

This also explains why *Tersina viridis* has developed a rather large, isolated breeding community in and around the Rancho Grande building where human interference has changed the natural habitat.

Possibly all newly formed ecological niches are first settled by younger birds which, through population pressure, are driven out of their home areas. Because of competition from old birds of both sexes, these younger birds are often forced to content themselves with inferior biotopes. Once settled, however, they soon develop a strong homing faculty. Therefore, *Tersina viridis* is rather evenly distributed along the road wherever adequate breeding conditions are found. The ecological extremes of open savanna and heavily wooded, humid gorges are always strictly avoided. After the road reaches the humid subtropical cloud forest, *Tersina viridis* is absent, except around a few human settlements and, of course, the ecological island of Rancho Grande itself. Here, however, it has found exceptionally favorable breeding conditions and is even more abundant than in the semi-evergreen forest. Tersina favors a broken landscape with not too dense secondary woods and many clearings. It is a bird of the high tree-tops and even while foraging seldom descends to the middle or lower strata.

Contact with human beings appears to cause a decrease in the distance at which tersinas will flush. This depends on the experiences of individual birds during their life-time and might be considered a biological pre-adaptation for following human civilization.

The wide range of ecological tolerance of tersina seems also to be a matter of individual variation and is obviously not based on micro-populations which differ genetically in having narrow, but different, ranges of tolerance.

The surprisingly large number of breeding pairs (six) around Rancho Grande cannot be a measure for judging population conditions in other parts, where there is not such an abundance of excellent nesting sites, and where more natural enemies probably occur.

General Habits.—With the exception of the times of nest-building and the feeding of the young, their daily cycle of activity and rest is rather uniform. About half of the day (six hours more or less), they are inactive; another 3 to 4 hours are devoted to their social activities, and about two hours are spent in foraging.

The tersinas are rather late risers; they never appear before sunrise, long after the general chorus of thrushes, vireos, trogons, etc., has begun. From about 6 to 11 a. m. they stay in their territories, rarely foraging but alternately being (according to their semi-social way of life) very active or sitting quietly on their favorite vantage points, sometimes without moving. This is true of both sexes.

From 11 a. m. to 3:30 p. m. they are usually absent from their territories. During this time most of the Rancho Grande birds fly down into the part-evergreen forests for foraging and resting in the course of midday hours. From 3:30 or 4 p.m. on, they are again present on their territories; the rest of the day is spent in the same way as the forenoon "activity" hours. At about 6 p. m. all birds (with the exception of breeding females) fly out of their territories to their roosting places, often far away. All the Rancho Grande birds roost in lower regions. I often observed the birds flying in a straight, almost horizontal line for 300 to 500 meters out over the deep erosion valley. Then, from above the semi-evergreen forest, they dropped vertically and vanished.

I have learned nothing about the actual roosting habits, but I am quite sure that during the breeding season the birds do not congregate in the night. In the mornings, the arriving birds are often very wet and sit for a long time preening and drying their feathers.

There were considerable differences in the sleep–wakefulness cycle during the different conditions of their residence at Rancho Grande. Shortly after their arrival in February and March their day was about one to one and one-half hours shorter than in April and May, when the breeding season was in full swing. Later, in June and July, after the main breeding season, the birds arrived much later in the mornings and again left earlier in the afternoons.

Approximate average times of arrival in and departure from territories:

	March	*April*	*May*	*June*	*July*
Arrival in territory	6:30 a.m.	5:45 a.m.	5:45 a.m.	7 a.m.	8 a.m.
Departure from territory	5:30 p.m.	6:20 p.m.	6:20 p.m.	5:30 p.m.	4:15 p.m.

It seems that the sleep–wakefulness and the daily activity cycles of *Tersina viridis* have no direct correlation with the absolute number of daylight hours.

Inherent as well as environmental factors are probably involved in the control of the cycles. In April, the inherent physiological factors seem to predominate, as this is the time of greatest sexual activity. The longer daytime activity is thus fomented. In May, both inherent and environmental factors control the necessity of caring for the young and promote the longer daily activity. In June and July, after the main breeding activities have ceased, the birds take no advantage of the longer daylight hours. In these months of excessive rains and storms, the delaying environmental factors are dominant. Also, with the onset of the rainy season (low temperatures, high humidity, mini-

mum of sunshine hours with a corresponding maximum of fog), the tendency to omit the morning activity hours and to show social activity only in the early afternoon (3 to 4 p. m.) becomes stronger, especially after stormy nights.

There is always, independent of sex and age, a great conformity of action under such extreme circumstances. But under normal conditions the males are markedly more active than the females; and the latter arrive on the territories five to fifteen minutes later in the mornings.

Though bright daylight is essential for the full display of the optical signal code of the tersinas, they are not fond of excessive sunshine. The birds are very sensitive to changes of light intensity. At about 11 a. m., when the sun is nearing the zenith, the time of "social activity" is over and the bright, iridescent colors are not "needed" any more; the tersinas then leave their vantage points and dive into the shade.

During foggy hours their senses are noticeably dulled. Then they often go astray and invariably fly only short distances.

Protective Color, Enemies, etc.—Though the green females have an ideal camouflage, the males are very conspicuous in their native surroundings; it seems that protective coloration has only very slight significance in the preservation of the species. With the exception of several snakes and possibly large land crabs, which may prey on eggs and nestlings in natural nesting holes, and rats (*Rattus norvegicus*) in the building of Rancho Grande, the tersinas seem to have very few potential enemies. Small weasels are absent, small marsupials (*Marmosa demararae*) very scarce, and the great majority of the smaller Venezuelan birds of prey not only avoid the dense woodland areas but also feed mostly on reptiles and insects, which are most plentiful in the dryer, cultivated parts. *Accipiter erythronemius*, *Micrastur ruficollis* (both rare birds of the lower forest strata), and *Falco albigularis* (a tropical species which regularly visits the ecological island of Rancho Grande) may prey on tersinas. The reactions of tersinas to mounted specimens of these birds of prey will be discussed later.

Flight.—Though generally a sedentary bird, tersina is an excellent flyer, often covering long distances above the highest tree-tops in a straight, scarcely undulating, line. The flight resembles that of the true finches, but it is lighter and the birds are more agile. In some phases it even recalls the agile movements of kingbirds (Tyrannidae). Usually the tersinas confine themselves to short flights from one scantily leaved tree-top to the next.

Being semi-social birds, they have a very distinctive code of intention movements which indicate the movements to follow and usually

affect other individuals present. They are ever ready to escape. The females, which usually sit lower and remain more concealed, are as a rule more timid than the males.

Bathing and Drinking.—Before the beginning of the rainy season and during dry weather, the tersinas are fond of bathing in pools and small streams. The act is always accompanied by a complicated ceremony of bobbing, wing-flapping, and hopping from stone to stone.

From May on, they did not bathe any more, but I often saw them drinking out of puddles on the flat roof of the Rancho Grande building.

Feeding Habits.—It seems very likely that the half-year residence of tersina in the Parque Nacional is strongly influenced by the fact that both fruit and insects are more abundant during the beginning of the rainy season than in any other part of the year. Tersina is an omnivorous bird; fourteen stomachs which I examined contained both fruit and animal matter, but the percentage of each varied considerably with the seasons. During the dry season, fruit seems to be the dominant source of nourishment, while from the beginning of the rains when insects crop out by the millions, until the time of departure, animal matter plays a very considerable part in the diet.

Great variations, possibly due to weather conditions which regulate supply of insects, were observed. During bad weather, fruit again dominated in the daily diet, because tersinas are accustomed to catch their insects flycatcher-like, on the wing. This method of catching insects was confirmed by the stomach contents, which seldom disclosed caterpillars, larvae, pupae, or cocoons, but consisted mainly of flying insects like small Orthoptera, flying ants and termites, and chiefly Diptera. Beetles and other insects with strongly chitinized cuticulae were rarely found. The only exception was "soft" beetles of the family Elateridae.

During certain periods, the young are fed mainly on insects.

In May, I repeatedly observed females hunting insects in the underbrush. This is unusual, as tersinas most frequently forage high in trees.

The tersinas have a strong predilection for big, pulpy fruit; small berries are rarely taken. Seeds are discharged whole with the excrement. Cecropia fruit, which forms a favorite dish for at least 25 species of Thraupidae and Icteridae, are apparently not liked by the tersinas. Only on rare occasions have I observed "lazy" males taking cecropia fruit from nearby trees to feed their young.

The favorite fruits of tersinas, like *Beilschmiedea roehleina* and the avocado (*Persea americana*), belong to the family Lauraceae. My pet birds also prefer the avocado to any other fruit, and they dislike

bananas. According to Pittier, the avocado contains 10 to 30 per cent fat, 3.6 to 16 per cent carbohydrates, and 1.3 to 7 per cent proteins. It is therefore one of the most nutritious fruits. Nevertheless, each of my tame birds eats daily about 20 to 25 grams of avocado, which corresponds to two-thirds of their body weight.

Wild tersinas also consume great quantities of food, and their throat-pouches often overflow. Unlike many other fruit-eating birds, such as cracids, trogons, toucans, cotingas, etc., tersinas seem never to swallow and to regurgitate the hard pits, but rather nibble off the fleshy pulp and then let the pit fall. In this way the tersinas assist in the dissemination of many trees.

Only rarely I saw tersinas foraging for fruit in the vicinity of the Rancho Grande building. Usually, even during the time of feeding of their young, they flew distances of 200 to 400 meters to collect the fruit of their favorite trees. While the females usually filled their throat-pouches at the distant fruit trees, the males sometimes followed another practice. They hopped side-ways close to the fruit, seized it with strong, wide-open bill, and by tossing the head back with an upward jerk, opened the mouth, froglike, before bringing the whole fruit—which was often bigger than their head—back into their territory. Then they often sat displaying fully their gorgeous plumage, bill wide open with the big fruit in it, the velvet-black mask showing in the most impressive way; sometimes they sang with a muted voice. I observed this performance enacted by three different adult males. It might well be a ceremonial act, with the aim of impressing the female.

I never saw a foraging tersina hanging head down, a common habit of the tanagers. The act of feeding is very peculiar, resembling that of a snake: the widely opened beak, with its sharp and pointed tomia and the enormous throat-sac, literally creeps over the big fruit, which is many times turned and twisted until the fleshy pulp is scraped off and busily gulped down. The instinct of "scraping" is very strongly developed. Pet birds are constantly using their wide-open bills for scraping whatever comes within their reach: clothes, buttons, human noses, ear lobes, etc. Large butterflies and moths are also swallowed by pet birds in a similar snake-like way. They use their hooked bills only for catching or gripping and then slowly gulp the insects down.

Voice and Song.—Most of the utterances of tersina are unmusical. The vocal repertoire centers about a monotonous, sharply pronounced chirping which, however, is very characteristic of the species and cannot be confused with the voices of tanagers or finches. Males are vocally more active than females. Most of the following vocal expressions, with specific biological significance, are common to both sexes:

1. Calling, ordinarily a single note *tsee*, usually uttered by a male sitting on a perch in his territory. During periods of activity, it is repeated with monotonous regularity; it may also be given before the nest when the female is brooding. The corresponding note of the female is much weaker. While this call is being given, the bird sits erect and motionless except for the bill which is opened halfway and then quickly shut.

2. Caressing, *se-se-se-su* quickly repeated, probably uttered only by male before and during copulation.

3. Warning and "flight-escape," one syllable *tse*, sharply pronounced by both sexes before flying away, also uttered by pets when an object falls suddenly.

4. Defense, very sharp *tse-it tsu-it*, uttered by both sexes when an intruder enters the territory.

5. Fighting, three to six syllables, a rather long, nasal *tsee wee it.*

6. Nestlings, whispering *we-we-we-we*, from second and third day after hatching.

Only the males sing. While singing, they always sit still; no nuptial display flights were observed. Ordinary advertising song, a metallic clinking twitter of four to seven syllables *tsee-wi-tit-tit-tit*, is heard only on the territory. It is softest during nest construction, when stalks are often held in the beak; strongest on favorite singing perches (tree tops, telephone wires, roofs, pinnacles).

The song plays only a small part in the social life of tersinas. It seems to have slight attractive influence on females and almost no warning effect on other males.

Singing begins after pair formation and "engagement"; the urge to sing is strongest during time of nest-building: at that time it also occurs during the midday hours, even when it is foggy. It is given less often after copulation and during the periods of egg-laying and incubation. Otherwise, it is heard on clear mornings and evenings (activity hours) during the breeding season, with the exception of the time when males are feeding the young. No song is heard when the temperature falls below 15° C. After the young leave the nest, there is a second singing period which dies away after a lapse of one or two weeks unless a second nesting is attempted. Great variation in the songs of individual males was observed.

I have not as yet heard the young males sing in the wild before their departure. However, the first clumsy twitter was given by a captive male at the age of 36 days (June 3, 1952) and full juvenile song between the ages of 60 and 70 days. Astonishingly, this juvenile song, though only uttered in a soft voice, not only consists of at least 15 to 20

syllables but has a very variable succession of different sounds forming a real melody, faintly resembling the song of the European Siskin (*Carduelis spinus*). A similar, very rich, but very loud musical song of at least twenty syllables was repeatedly heard on June 8, 1952. It was uttered by an unmated male, one year old, sitting on top of a *Gyranthera caribensis*, 40 meters high. These observations indicate that young males have far more complex songs than the adults, the songs of which seem to be simplified in favor of special movement reactions, which will be described later.

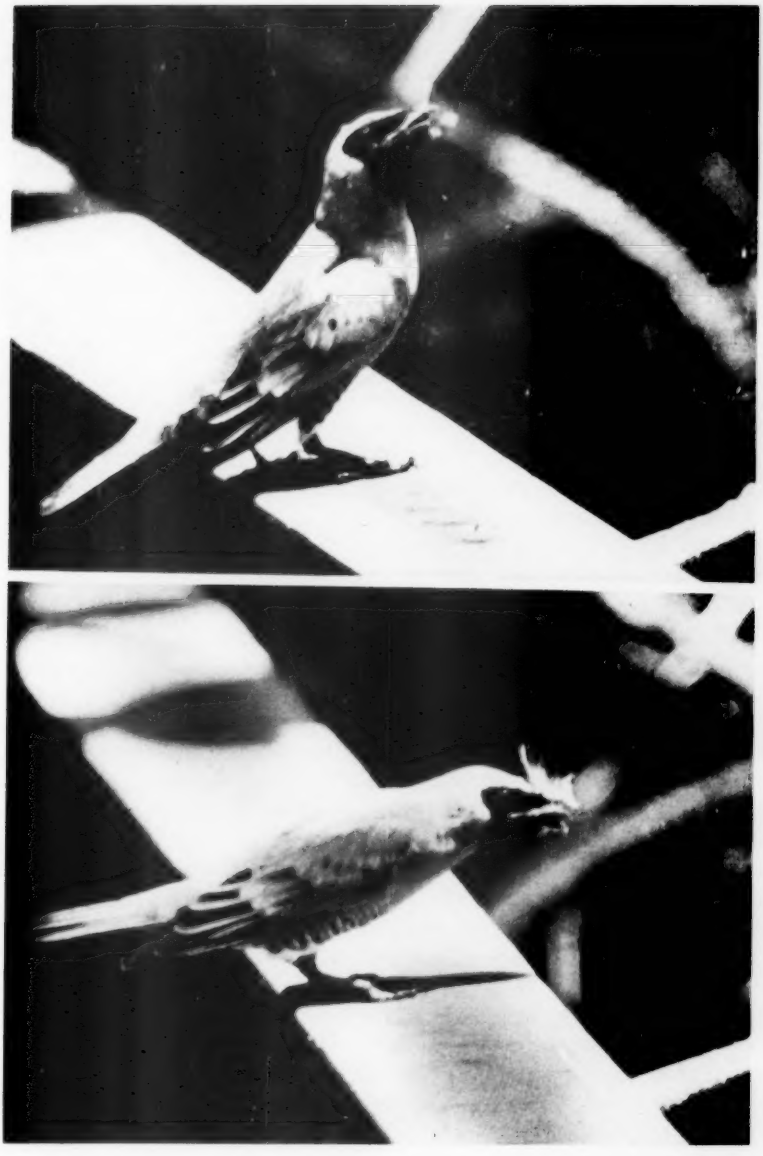
CLIMATOLOGICAL DATA DURING THE 1952 BREEDING SEASON IN THE ECOLOGICAL ISLAND OF RANCHO GRANDE

Month	*Temperature in degrees C.*		*Rainfall in millimeters*	*Insolation, total hours*	*Breeding activity*
	High	*Low*			
February	27.5	13.5	—	—	arrival
March	26.5	14.5	18.0	194.5	engagement and pair formation
April	26.5	15.0	157.7	105.5	nest building and incubation
May	26.2	15.5	149.7	152.0	nestling time
June	25.7	15.0	254.0	110.0	under normal conditions, end of breeding
July	24.5	15.0	340.2	102.0	

Arrival and Pair Formation.—Comparative observations in 1950, 1951, and 1952 have proved that the entire breeding cycle of *Tersina viridis* in the Parque Nacional de Rancho Grande depends on the local weather conditions. While the years 1950 and 1951 had rather indistinct seasons, 1952 was, according to the information I received from Dr. Goldbrunner of the Meteorological Service of the Venezuelan Air Forces in Maracay, the only really "normal" year of the three. So, 1952 had a very pronounced dry season which lasted until March and was then followed by an extremely wet, rainy period.

General breeding records concerning the entire avifauna in the Parque Nacional give conclusive evidence that in 1952 the breeding season not only was much more uniform but also began and ended three to four weeks earlier than in the two preceding years. This also applies to *Tersina viridis*.

It was certainly because of the very dry weather in February, 1952, that the tersinas arrived at 500 meters as early as February 14. This was about 12 days earlier than in the two former years. Furthermore, the extremely dry conditions at Rancho Grande (1,000 m.) in Feb-



ADULT MALES IN CURTSY POSITIONS WHILE FIGHTING. PHOTOGRAPHS BY K. KOCH.

ruary, 1952, were certainly responsible for the short interval of only three days (twelve in 1950 and eight in 1951) between the arrival at 500 meters on February 14 and the first record in Rancho Grande on February 17.

Between February 14 and March 31 the dry weather with very little fog continued. During this time of pair formation, territory establishment, and "engagement," no differences in these activities between the populations at 500 and 1,000 meters were observed.

Though there was a slight predominance of male birds during the first days, females and first-year birds arrived at almost the same time. The time of arrival of the entire Rancho Grande population (6 definite pairs) extended over 10 to 15 days.

Pair number 1, consisting of obviously "old" birds, arrived on February 14 already "engaged." Male one immediately took possession of and defended an avocado tree in front of the building, which in the two preceding years had been the center of the territory of an adult pair.

Though it was rather difficult to distinguish individual birds during the first days of almost continuous commotion before the establishment of territories, I had the impression that at least half of the Rancho Grande population arrived already paired. For the first two weeks, the birds stayed only for about one hour in the forenoon and as long in the afternoon. If the weather was foggy, no birds were seen. All birds came and went together; sometimes as many as eight birds, half males and half females, formed little flocks.

During early March, the birds became more sedentary and the formation of definite pairs took place; new pairs formed and segregated themselves from the group. As the males did not sing at this initial stage, the females seemed to be mainly attracted by the sight of the striking colors of the adult male birds. From the beginning, the latter had a strong predilection for fixed lookout branches in the tops of the trees, where they exhibited themselves.

When a young and an old male were sitting on neighboring trees, the newcomers of both sexes were invariably attracted by the old male. Young males were often completely ignored. Experiments with mounted birds have clearly shown that a quietly sitting bird provides nearly as strong a stimulus as a moving one. Certainly the optical characteristics are most important as recognition marks of the sex partner as well as of competitors of the same sex.

In the process of pair formation, the female plays the dominant part. The following observation on February 20 is typical: an adult male and a young male (2 years old) sit quietly close together on a high pinnacle of the Rancho Grande building; a female arrives and alights 1.5 meters

away. Immediately she begins curtsying (a very complicated movement reaction which will be described later), takes a blade of grass in her beak, and approaches the older male with bobbing movements. While the young male remains passive, the old one first draws back, then also begins curtsying until the female, followed by the gallant, flies to the flat roof immediately below. Now the female takes up some small particles, possibly pebbles. The old male approaches her from behind and, trembling with excitement, feeds her in a symbolized action but without uttering a sound; during this ceremony the female stoops a little, spreads the tail, and lets her wings hang down as if before copulation. From now on, the male does not allow "his" female out of sight, follows her from stone to stone, from branch to branch, rarely sits farther away than one meter, and while sitting on tree tops always occupies the higher position, showing his silky brilliance and the black mask in the most impressive way. Often both partners sit close together for half an hour calling to each other at intervals of 4 to 6 seconds.

In the course of this phase, there existed only one movement reaction, in which the female promptly followed the male. This was a formalized act of "pebble-flicking" on the ground, the actual meaning of which was not clear to me. It was always initiated by tripping steps of the male while he pressed his plumage tightly to the body, stretched his neck, and let his head appear extremely flat.

The partners of an established pair always remain in very close contact, although the actual sex functions are still dormant. Knowing each other well, they seldom associate with other tersinas. The specific menacing position with which they formed their first ceremonial contact ceases completely. Several times I had the opportunity to observe that an already "engaged" male sat near, but completely indifferent to another pair.

After pair formation, the birds become much calmer. Very seldom one observes that several birds of different sexes are following each other, which was a daily occurrence at the time of arrival. Also, demonstrations of "tenderness" exchanged between the partners of one pair seem to be much rarer now.

Territory.—Another great change takes place while definite territories are being selected. This is a relatively slow, cumulative process, which sometimes occurs with pair formation but as a rule follows it. It takes definite shape only shortly before nest-building begins. In 1952 there was no definite sign of territorial boundaries until March 17. Several things may be responsible for the relatively late selection and establishment of territory. Among them are the semi-gregarious habits

and the fact that the breeding and living biotope and the food biotope are very different and lie far apart. Also, the advertising song plays no essential part in the breeding habits.

The quantity, selection, and the relative dimensions of the territories are largely correlated with the density of population. General topography, human interference, and the structure of vegetation which have produced the almost universal edge effect are primarily responsible for the formation of 80 to 90 per cent of the breeding territories of the entire population of *Tersina viridis* in the Parque Nacional. They are concentrated along the road. I estimated the number of territories on a stretch of 10 kilometers at about 50. Under normal conditions we might expect a territory every 200 meters. Only where bridges are concentrated do we find more.

The average extension of the territories along the road is about 50 by 100 meters. Many of these territories are isolated and do not border on others. In and around Rancho Grande, however, we find a mosaic of territories with only small intervals between because of of the location of favorable nesting sites. Here, six territories were concentrated on a stretch of only 300 meters which means that the Rancho Grande population is four times denser than that along the road. Accordingly, the territories at Rancho Grande were very much smaller, the maximum being about 40 by 60 meters and the minimum about 15 by 30 meters. Along the road as well as around Rancho Grande, we were able to show that population pressure is so strong that if the exit of one nesting pair frees a territory it is immediately filled by a new pair.

Undoubtedly the main activity in founding a territory lies with the male bird, who is also its sole defender. The basic requirements seem to be good visibility, the proximity of at least one suitable nesting site, and one or more vantage points. Favorite vantage points are treetops with horizontal, sparsely leaved branches, telephone wires, roofs of building, etc., from which the territory can be watched and defended.

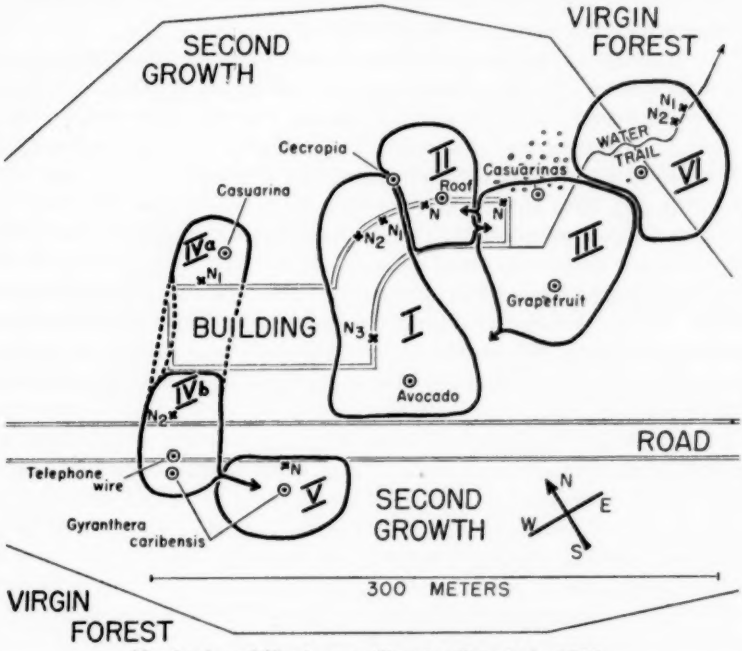
The main functions of the territory seem to be: first, to guarantee a certain isolation and equal distribution in a given breeding area; second, to advertise a nesting site; and third, to protect the nesting site.

All territories have two centers towards which all social activities, including defense, are concentrated. The first is the main vantage point of the male, who also "represents" the territory. This is not necessarily situated in the geographical center of the territory, but is determined primarily by visibility. The second center is around the nest itself.

Boundaries are sharply drawn only on the borders of small territories. When breeding activities are at their peak during the time of building and copulation, the borders are best kept. Later on, a certain negligence is observed.

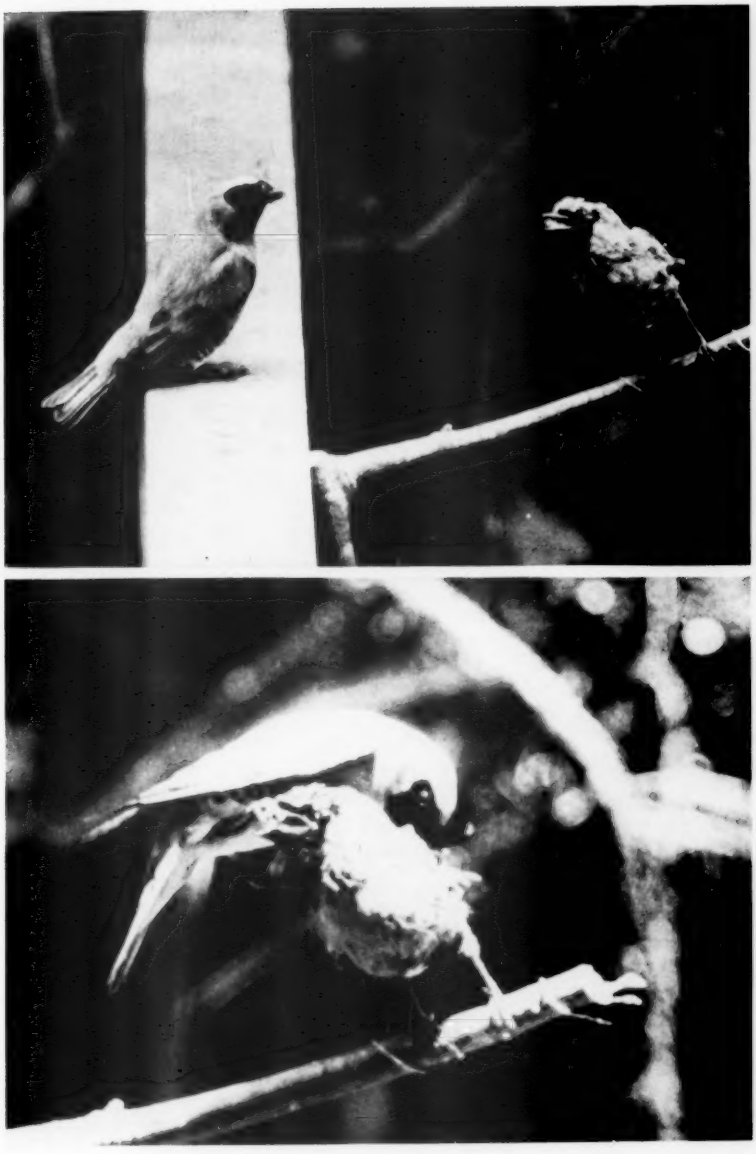
The territories of old males nearly always occupy the "best" places of a given breeding area. The younger males, whose sexual activity begins later, have to content themselves with the rest; but as the younger males are always on the defensive, their faithfulness and homing faculty are greater.

In general, no other tersinas are tolerated in an occupied territory, but there are many exceptions which will be discussed later. In the



Territories of Tersinas at Rancho Grande in 1952.

Rancho Grande colony, a well balanced hierarchy existed. The dominant bird always was the old male of territory one, who seemed to be well known to all other males. Though not "agressive," male one seemed to be more "self-assured" than all the other males, and his presence was always respected. He was the "owner" of the first and largest territory (see figure 1); he was also the first to arrive (February 17) already paired, and the last to leave (July 12) together with his



MALE TWO ATTACKING MOUNTED MALE. PHOTOGRAPHS BY E. SCHAEFER.

female who was dominant over all the other females and probably the oldest. Their late departure was due to the fact that they were not able to raise any young in spite of three attempts. From his avocado tree male one dominated the whole Rancho Grande breeding colony. He had another vantage point in common with male two (of territory II) on the border of their territories.

The territory of pair two was the smallest of all; it was squeezed in between territories I and III. Male two shared the vantage point on the cecropia with male one but preferred his own on the roof of the building. Details will be given later.

Territory III of male three was on the edge of the uninhabited part of the building. Male three had his vantage point on a grapefruit tree. He had a tendency to enlarge his territory in the direction of the avocado tree of male one, who usually scared him away by his presence alone.

The first territory (IV-A) of male four was in a rather unfavorable position in the back of the inhabited part of the building. A small *Casuarina* tree served as vantage point for this young, very timid, probably two-year-old male. After the first young of pair four had flown, the territory (now IV-B) was shifted to the front of the building, where a new nest was built in a wall along the road. Here the telephone wire and a huge *Gyranthera* tree, 40 meters high, were selected as new vantage points by male four.

The territory of male five was small. It centered around a huge *Gyranthera* tree and a bridge. When the young of pair five were big and the boundaries of territory V no longer sharply watched by male five (an adult bird), male four enlarged his second territory (IV-B) in the direction of territory V without being molested by male five. Males four and five used the same tree as a vantage point.

The territory of male six (found last) was on the edge of second growth and virgin wood along the "water trail" east of the building. A large, isolated tree left from the virgin forest served as look-out, but two successively built nests were actually about 30 meters and 40 meters, respectively, inside the virgin forest, close to the man-cut embankment of the water-trail.

Co-inhabitants of Territories.—Many other species were found within the territories of the tersinas, but with the exception of actual competitors for nesting-holes, they were in no way molested by the tersinas. In fact, the latter never actively associated with other birds. On the other hand, their very favorably situated vantage trees also drew many other species of birds. Besides many purely accidental meetings I observed a kind of rank order.

The most prominent vantage point was the avocado tree in territory I, standing by itself and offering ideal resting or hunting conditions for flycatchers. It had a horizontal twig in its top, which not only was the favorite spot of tersina male one, but also attracted quite a number of other birds. On this very twig and in the space of a few centimeters I observed 21 other species during the breeding season (March to July) of tersina pair number one.

There were only a few birds which did not respect the tersina male when he was perched on "his" twig. These birds, which were definitely dominant over *Tersina viridis*, were a pair of *Tyrannus melancholicus* (banded), not breeding; a pair of *Thraupis episcopus*, breeding; and a pair of *Tachyphonus rufus*, breeding. It is interesting to note that all these birds are invaders from the tropical belt. If one of these birds appeared, tersina male one hopped quickly to another twig near by. There was never any fight nor defense observed for this much coveted twig. If tersina male one was not present, female one sometimes sat on the twig.

Tersina viridis shows altogether a very conciliatory attitude toward other species in and outside the territorial boundaries. Competitive fights for favorable nesting sites were observed against the swallow, *Pygochelidon cyanoleuca*, about 35 to 40 pairs of which breed in the building of Rancho Grande, and on one occasion against *Philydor rufus*. The latter fight took place on May 25, 1950. It clearly showed that a male tersina does not attack a territorial intruder, but very resolutely defends the nest with the young just as colonial breeders do. It must be mentioned that *Philydor rufus* generally digs its own nesting burrows in the virgin wood and that it therefore seldom competes with *Tersina viridis*. In the above mentioned instance, a *Philydor rufus* tried with great persistence to enter the nesting hole of a pair of tersinas with three young, 6 to 8 days old. During the first stage of the struggle, while the female tersina was on the nest and continued to feed her young, the fight was conducted by the male, obviously an old and experienced bird. His feathers ruffled, bill half open, he stood in a defensive position about 50 centimeters from the entrance hole of his nest, while the philydor was on the watch one meter in front of him, in smooth-feathered position. As soon as the philydor made a thrust forward to enter the nesting hole, he was seized by the male tersina with beak and claws and both birds rolled to the ground, where they soon separated and took up their former positions. This was repeated three times during twenty minutes. Then the philydor flew away.

The "Curtsy Reaction."—When dealing with or fighting against other birds, the tersinas never showed a fundamentally different

bearing from other passerine birds. However, their own social code consists of a series of unique and rather eccentric movements and positions which completely dominate the social behavior in both sexes. I have called this innate, stereotyped, and rather complex signal code the "curtsy reaction."

Though this curtsy reaction seems to have a multitude of different meanings, which we will analyze later, it seems that in all cases the bird "enjoys" it. Undoubtedly it is correlated with sex functions and is intensified with age. Basically it may be interpreted as "play," in the strictest sense of the word, a self regulating reaction completely forming its own object. In principle it reminded me of the social dances of some Rallidae like *Porphyrula martinica*, or the vocal mass tumults of some Cracidae like *Ortalis ruficauda*. It may therefore also be classified as a surplus or extravagant reaction common among tropical birds and mammals.

The curtsy reaction involves more than one individual and is released either by sight or movement if two or more adult birds are together. It follows the avalanche principle, oftentimes "infecting" a whole group to participate in an orgiastic mass ecstasy of stereotyped movements. It has a blind reflex character without restraint or interruption and is often continued long after the original stimulus has passed.

In its most common form, the curtsy reaction begins with a pose of "boasting." The two or more partners or opponents face each other. All feathers are tightly appressed, the flat head is lifted, the wing tips hang down, the wings and tail sometimes tremble. Then a very characteristic and sprightly bobbing movement begins. From a distance it looks as though the birds are in mechanical contact with each other. The low bow of one bird almost exactly corresponds to the greatest erectness of the other.

During the first phase, the bow, wings and tail hang down, legs are bent, and the head is the lowest part of the deeply bent body. This movement is comparatively slow.

The second phase consists of a sudden upward jerk of the entire body which is then kept in a very stiff, almost vertical position. The head, now the highest part, is thrust backward, the beak directed upward. Though the bill may be half-open, I never heard a sound uttered during the whole procedure.

This mutual up-and-down movement may be repeated 20, 50, and up to 300 times, depending on the stimulus and the accumulated excitement. It is sometimes accompanied by bouncing hops through the horizontal branches of cecropia trees, the birds gamboling, chasing,

and fencing with each other. During this rapid give and take, it is also a common practice to attempt to perch higher than the others' heads in order to gain advantage; but generally the birds do not strike against each other's bodies.

The whole curtsy reaction seems to be superimposed on a great many social and emotional actions. I was unable to differentiate the various components of this dominant reaction. We will therefore limit ourselves to enumerating only the most important stimuli which in the course of the entire breeding season automatically release the curtsy reaction.

During the initial phase of pair formation, when the birds do not yet "know" each other, both sex partners often curtsy in an almost hostile attitude. The curtsy is a display which is used under a variety of situations, such as "impressing each other," courting, display, challenge, and defense. After the partners are once accustomed to each other's presence, the action ceases completely.

The arrival of one or more strange males in a territory releases the action almost automatically. After the "owner" of the territory has chased the intruder in circles around and out of his territory, he immediately ceases curtsying and returns to his vantage point. Also, the sudden appearance of a known bird frees the curtsy reaction, which stops as soon as the unexpected visitor is recognized.

Among neighboring males, territorial defense curtsying is often observed, especially during the daily activity hours. This is particularly true if territories are small and boundaries sharply drawn. The male in whose territory the curtsy duel is fought generally "wins."

Although most pairs of the Rancho Grande breeding community lived in harmony, the potential preparedness for defense curtsying among adult males was maintained until the end of the breeding season. It seems to be weakest during the time of incubation.

With the exception of the already described "first meetings" of still sexually inactive males and females, the curtsy reaction is generally only performed by birds of the same sex. Males will then only curtsy with, or against, other males. This unisexual relationship also inhibits the increase of the reaction when two males curtsy in the presence of females. The females curtsy much less. When present, they act as onlookers. Females have a tendency to trespass territorial boundaries, and as they are frequently followed by their males, they give direct cause to territorial defense curtsying.

The oldest and most quarrelsome female of the whole Rancho Grande breeding community (female one) was the only one which often curtsied against other females. On March 25, when female two flew

(*Top, left*) TYPICAL SMALL NEST WITH FIRST EGG, AT LOW ELEVATION (500 METERS). (*Top, right*) TYPICAL NEST WITH FULL CLUTCH. (*Bottom*) YOUNG IN NEST TWO, 6 TO 8 DAYS OLD. PHOTOGRAPHS BY E. SCHAEFER.

close to the prospective nesting site of female one, the latter attacked female two, curtsying exactly like a male. Then she clawed female two and drove her away. On April 30, after the young had hatched, female one again "attacked" female two in the same manner. When female two did not respond, female one approached her neighbor to within 3 to 4 centimeters and curtsied about 150 times at this close distance before the completely inactive female two. In doing so, female one many times retched food out of her bulging throat sac and afterwards swallowed. it. On this occasion both females neglected their young for about two hours.

When old males are present, the young ones usually try to escape. Only in exceptional cases (to be described later) did I see young males engaged in territorial curtsy duels. Instead of participating in the curtsy activities of older males, they more frequently sang within the boundaries of their territories.

There is a possibility that in the evolution of the social life of tersinas, the curtsy reaction was substituted for the original song performance still maintained by young birds.

Very often the curtsy reaction culminates in a real mass ecstasy. We have mentioned before that neighboring birds know and, according to their rank order, also respect each other, at least under normal circumstances. As by nature tersinas are sociable, the territorial fights are rare after the rank order is once settled. The males, sometimes with their females, meet regularly during the activity hours. It was thus not uncommon to see several pairs peacefully sitting together in the same tree. This was mostly on the avocado in territory I, or the cecropia between territories I and II. Then, without any apparent reason, the whole group began curtsying in a frantic display. Sometimes, especially before nest-building time, but also even during incubation and feeding intervals, the females were infected to such an extent that they neglected their young for hours.

The young males of the Rancho Grande community generally did not participate in these mass curtsy dances. One exception, however, was noted on April 1, 1952, when nest-building began. That day, at 8 a.m., young male four and female four joined in an orgiastic mass dance conducted by twelve birds in the highest branches of a giant *Gyranthera caribensis* tree in front of the Rancho Grande building.

Mass curtsying often takes place in the early morning hours, after the males have arrived from their roosting places. Even when young were in the nest, adult males rather preferred their mass curtsy plays to feeding their young. Only when temperatures fell to 15° C., all curtsying activities stopped. This activity had a new climax in the

beginning of June, after the broods were independent and many strangers arrived in the Rancho Grande community.

Mass Insect Catching.—Here we must also mention another activity of equally strong social character. Between the sixth and the fourteenth day after hatching, when insects were fed to the young, mass insect catching was almost completely substituted for the customary curtsy plays. The main difference seemed to be that the instinct for curtsy play was now overcome by the brood-rearing instinct. Independent of sex and age, all birds of the Rancho Grande community actually took part in these mass foragings, which seemed at the same time to be first indications of a gradual transition from breeding behavior to post-breeding flocking behavior.

Late every afternoon, the adult tersina population of Rancho Grande gathered in the tops of the casuarina trees belonging to territory III to catch insects for their young. There was a continuous coming and going between the nests and these trees. The strong social character of this action was accentuated by the fact that all birds remained in a flock even when moving to other tree tops. The main activity was always in one tree, often together with pairs of *Thraupis palmarum*, *Thraupis episcopus*, *Tangara heinei*, *Tyrannus melancholicus*, and *Myiozetetes similis*. Unlike the tersinas, the latter birds often changed trees. They were never molested by the tersinas, and *vice versa*.

This social insect-catching was done in the same manner as flycatchers do. The individual bird rose from 3 to 10 meters above the tree, often caught one, two, or three insects, and then went back to his starting point. The females were more agile and more dexterous. Usually they returned to their branches in beautiful glides, with tails spread fanlike. The old males were still partly governed by the curtsy instinct. This was obvious when an old male returned to a branch which had meanwhile been occupied by another old male. Still in flight, he began to curtsy (never observed on any other occasion), performing swinging, awkward-looking up and down movements before perching. Once he was perched, however, the curtsy movements were not continued.

Experiments with Mounted Birds.—With respect to sight recognition, fright and defense reaction, and individual behavior, many experiments with mounted birds were conducted.

For this purpose, mounted tersinas, males and females, a male of *Chlorophanes spiza* (a bird which to the human eye resembles the male tersina in the wild), a bat falcon (*Falco albigularis*), two small hawks (*Accipiter erythronemius* and *Micrastur ruficollis*), and two owls (*Bubo virginianus* and *Ciccaba virgata*) were fastened to long poles so that

they could be easily shifted from one place to another. The results follow.

The mounted tersinas were specifically recognized at a distance of at least 150 meters. They were treated by the live birds exactly as if they also were alive. The mounted males were more quickly recognized than the mounted females.

As could be expected, a confusion with *Chlorophanes spiza* never took place. Also no attention was paid to the mounted *Chlorophanes* when it was put close to the nesting holes. It was "nonexistent" to the tersinas.

The owls were neither feared nor attacked. There was a certain uneasiness shown (especially by timid pair three and young male four) but feeding activity was not interrupted, even when the mounted owls were exhibited three or four meters away from the nest entrances. This apparent ignoring of the owls may be explained by the fact that tersinas are strictly diurnal birds, going to roost by early twilight, and most owls of the Rancho Grande region feed almost exclusively on insects and land-crabs.

The sight of the hawks excited the tersinas to such an extent that they interrupted the feeding of their young if the hawks were put close to their nests. But actual fear was not demonstrated. Both hawks are quite rare birds and are seldom seen in high trees.

The only bird of prey specifically recognized and *really feared* was the bat falcon. When the mounted falcon was exhibited, no tersina dared to come close and none entered its nest. If the falcon and an owl were exhibited together and the falcon then taken away, the tersinas immediately began feeding again. The bat falcon is (with the exception of the true eagles and the rare North American *Falco peregrinus*) the only "noble" predator of the Parque Nacional which hunts above and in the tree tops and has a predilection for small birds.

Reactions to mounted tersinas were in no way uniform. Male one, the leading male of the whole breeding community, did not attack the mounted male. After he became accustomed to the latter, he treated it in just as "friendly" a manner as he treated the males when they came as visitors into his territory. Several times he tried to induce the mounted bird to join in the curtsy play. Female one, however, was very aggressive; she attacked the mounted female many times, but paid no attention to the mounted male. The most interesting experiment with pair one was as follows: two mounted birds were fastened two meters away from the nesting hole; female one was on her nest and male one on his perch on the avocado tree. Male one immediately approached to 20 centimeters from the mounted male

and began curtsying. This attracted male and female two and male and female three. All of them alighted close to the curtsying male one. Then female one came out of her nest and all three males began a frantic curtsy dance on the ground. The mounted male which had orginally stimulated the action was not given any more heed. Only female one did not join the orgiastic dance but with long bouncing hops, attacked the two living females and the mounted one with the obvious aim of driving them away from her nesting site.

Pair two, whose territory was squeezed in between territory I and territory III, was undoubtedly the most aggressive and therefore also rendered excellent results in these experiments. On May 7, at 11 a.m., the mounted birds were fastened to two poles five meters long. They were put three meters apart, to right and left of the nesting hole of pair two. Male one and male two alighted on the wall above nest two and began curtsying to each other in the usual "friendly" manner. Male one then flew away showing no further interest. Shortly afterwards, male two and female two alighted about one meter from the mounted male. Male two immediately began to curtsy before the mounted male but paid no attention to the mounted female. The latter was then slowly brought to a distance of only five centimeters from curtsying male two, yet male two showed no reaction. The mounted female was then put back in its original place. As soon as the mounted female "passed" the nesting hole, female two attacked the mounted female and curtsied about fifty times before it. Then female two calmed down and sat for about 20 minutes at a distance of 50 centimeters from the mounted female. After this, female two flew away and fed her young. Meanwhile male two had entered into the second phase of his attack. In full fighting rage he hovered around the head of the mounted male and tried to alight on its back. During the third phase, which lasted 47 minutes, male two threw himself on the mounted male, sat on its back or head, wildly picking at its eyes, head, and neck and trying to strangle it. While frantically beating his wings, he also regurgitated a pulp of insects and swallowed plucked feathers of the mounted bird. This he repeated about 10 to 12 times, and the mounted male was slowly torn to pieces. Next, the pole with both the mounted male and the vigorously fighting male two sitting on top of it, was carried to the nest hole and the mounted bird slowly pushed into it. As male two seemed to be only interested in fighting his "opponent," which had already lost a wing, not the slightest change in behavior was noticed. Female two made no attempt to defend the nest against the "foreign male." She sat passively on one of the iron girders and observed the

fight. The mounted female was then put close to the nest. Immediately female two attacked "her" furiously. She also alighted on top of the mounted female and tried to strangle it. After this, both mounted birds with both live birds still sitting on top of them were carried in the direction of territory III. As soon as the inner border was passed, they flew back into their own territory, catching insects on the way, and the female started feeding her young again. Then the mounted birds were stationed on the border. About 15 minutes later, male three arrived and *without passing the border* instantly began curtsying before the mounted male. Male two and female two saw it and immediately renewed their attacks *from their side.* It is a very instructive sight to see both males fighting the same male "intruder" from their own ground and territories. Female two of course only fought the mounted female. Then, male two and female two again pitched onto the mounted birds and male three soon withdrew to the center of his territory.

Similar experiments were repeated on different days. The results were the same. Though the mounted birds soon looked very shabby and had to be stitched together, the tersinas always attacked them as though they were live birds.

Both male three and female three were very timid. While female three showed only fear and never attacked, even if the mounted female was put close to her nest, male three fought in a rather irresolute way and often merely watched attentively. Only if the mounted male was put in "his" grapefruit tree, the look-out center of his territory, he attacked courageously, sitting on the mounted bird in the same way as male two. On May 8, male three even tore a wing off the mounted male, swallowed feathers, and immediately after his "victory" fed insects to his female, who sat beside him on a grapefruit tree.

Male four and female four reacted very similarly. They were even more timid than pair three and often completely indifferent to the mounted birds. When the mounted male was put in the casuarina tree of male four, the latter continued feeding his young. Only once he tried to curtsy in a very awkward way before the mounted male. Evidently the instinct for territorial defense is little developed in younger birds.

Selection of Nesting Site.—Though I had the strong impression that old females like female one sometimes actively search for old nesting sites of the year before, there is no doubt that the primary selection is done by the male. This "searching" begins at least 8 to 12 days before the actual nest is built. In 1950, the searching time was April

1 to 10; in 1951, April 8 to 15; in 1952, March 23 to 31. No difference in time was observed between the population at Rancho Grande (1,000 meters) and that of the deciduous forest at 500 meters. This may be due to the fact that the main climatic changes which bring about the end of the dry and the beginning of the wet season affect both altitudinal belts, not only at practically the same time, but also in a very similar way.

Usually the male flies close to the prospective nesting site and the female follows him closely. During the entire breeding season, this is one of the few occasions when the female willingly follows the male. The female then sits quietly, sometimes calling at short intervals and watching attentively all movements of the male. The male is very active. Seemingly attracted by all dark objects, he hovers restlessly from one hole, burrow, or cavity to the next. Sometimes he also flies in spirals and circles in a kind of symbolic dance, which reminded me of a hummingbird flying from flower to flower. During the first days, there is no system in this hovering dance. The male seems only trying to awaken the interest of the female for a general place but not for a definite hole or burrow. The male often alights near the female and sings. During the next phase of "demonstration," the male takes up blades of grass or other light-colored material such as the inner bark of *Cecropia* or *Miconia* and sings a soft, muted song, holding the material in his bill. From this time on, the female becomes interested too. Often she follows the male and hovers in the same way he does. Then the male enters a hole with the material in his bill and after a few seconds looks out again, displaying fully his gorgeous plumage.

To the human eye, the effect of this peculiar signal is that of a "target": the center consists of the much distended velvet-black mask, surrounded by a turquoise ring, which with every turn and movement changes its vivid iridescent color from green to deep blue. The outer ring of the target is formed by the black of the entrance hole itself. Often I had the strong impression that the black-mask-signal not only released the "enter-the-black-hole" reaction, but also produced an association which led the female to search from now on for black holes herself.

The fact that young males lack the black mask has certainly selective importance in that it minimizes their chances for propagation. Through the "black-mask-effect," the male "invites" the female to search too, which she always does in a much more particular way than the male. As soon as she finds a nesting hole to her liking, she usually occupies it without further searching. Independently of the fact that

the female may already have selected a nesting hole, the "searching" and "demonstration" instincts in the male continue in a rather undecided and playful way for many days, at least until the actual nest-building begins. There is, of course, considerable individual variation. One case was observed (pair two) in which the male and female first occupied different holes in close proximity until the time when actual nest-building began. Only then did the male change over to the hole of the female.

Conditions of Nesting Site.—Contrary to most statements, the tersinas of the Parque Nacional never selected holes in trees as breeding places. They invariably bred in cliffs, earth walls, road-cuts, or stone walls or under bridges. Of 28 nests observed during three years, I found only three constructed under completely natural conditions. Two of these were in cliffs and one in an earth wall caused by a landslide. Four more nests were in earth banks, five under bridges, and sixteen others in man-made perpendicular walls. The height from the ground seems to be of no importance; it varied between 1 and 3 meters. The nests constructed under natural conditions were found between 50 and 70 centimeters inside the tunnels; the majority of the other nests were found 1 to 2 meters deep, varying according to the depth of the hole. One nest was found only 5 centimeters from the entrance, the deepest was 2.3 meters from the entrance.

The natural nesting hole in the vertical earth wall beside a small stream was surrounded by about ten half-finished earth tunnels, which seemed to have been dug out by the tersinas themselves (see plate 16). In another case, the burrow was obviously constructed by *Philydor rufus*.

The diameters of the entrance holes of natural nests were between 6 and 10 centimeters; the entrances of the artificial holes showed much variation. Usually they were rectangular or square, and measured about 20 by 25 or 20 by 20 centimeters. With very few exceptions, the actual nests were built at the back of the holes or the straight burrows. The entrances of the nests were never camouflaged. In one case, an occupied nest of the tropical *Turdus leucomelas* was only 50 to 60 centimeters from the entrance to a tersina nest. The two species in no way disturbed each other.

Before the arrival of the tersinas in 1952, we constructed about 20 wooden nest-boxes and hung them close to the nesting sites of the previous year. Not one was used. The tersinas definitely preferred the deep holes in the stone walls.

Two out of three pairs which built second (or third) nests showed a tendency to choose more open, drier, sunnier nesting sites than those used for their first nests.

They moved from the shadier and damper back of the building to the sunnier front. This was apparently due to the very much heavier rainfall in June and July.

Nest-building.—Although in 1950 and 1951 no exact observations were made, it was impressive to see that after the very dry "dry season" of 1952, nest-building began rather "explosively" after the first rains. This applied not only to the entire tersina population of the Parque Nacional, regardless of biotopes and altitudes, but also to a great number of other species of passerine and non-passerine birds.

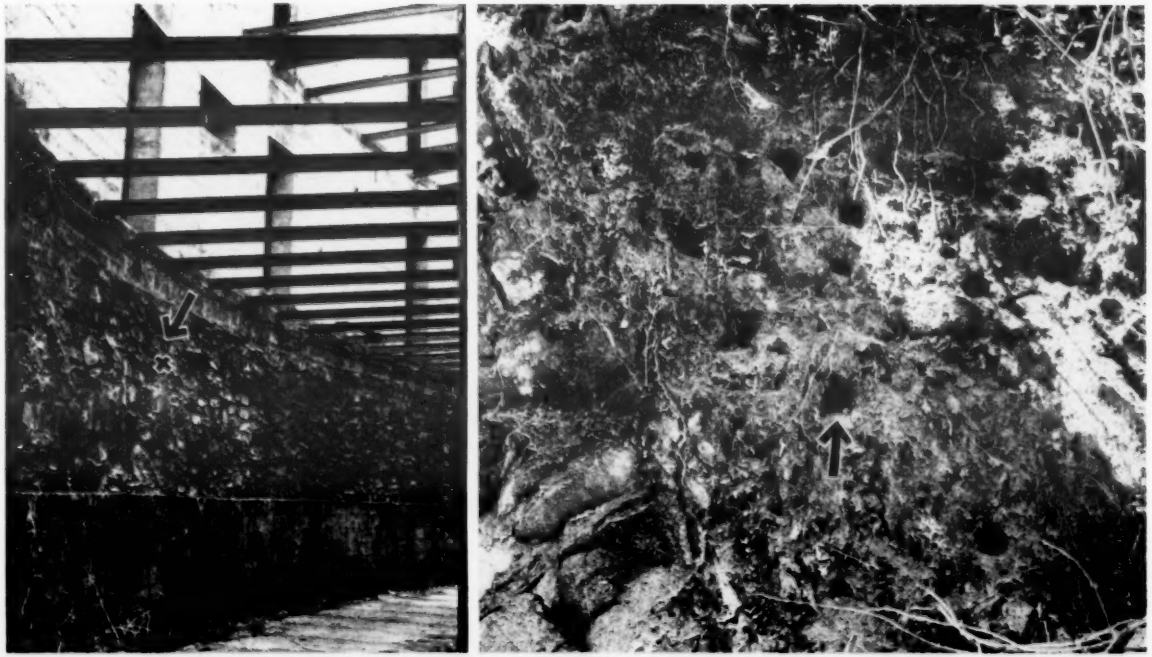
Of nine pairs of tersina whose nest-building activities were under observation, four began to build their nests on April 1 and 2: one and two days, respectively, after the first rains had fallen. Three of these nests were at about 500 meters and the rest between 900 and 1100 meters. However, accurate nest-building observations were only made with pairs one, two, and three at Rancho Grande. All three nests were situated in holes in the wall of the unfinished part of the building, and all three could be watched from one observation point, as the greatest distance between them was only 45 meters. The entrance of nest one could not be seen, as it was situated between two dark walls; the entrances of nests two and three, however, were plainly visible. There were iron girders before each nest, and these were favorite resting places on which the birds could be observed very closely. The progress of nest construction was observed with the help of flashlights.

Nest one was begun April 1 and finished on April 6 (six days); 81 construction trips of the female were observed. About 60 of these trips were concentrated in the first four days. During nest-building, the male sat singing or watching on the wall above the nest. Further activities of the male will be described later.

Nest two was begun on April 2 and finished on April 8 (seven days). Female two was a rather slow builder; only 54 construction trips were observed, about 30 of which were made in the first three days. Both male two and female two used to sit for hours on iron girders watching their nesting site during intervals between construction trips.

Nest three was begun on April 9 and finished on April 13 (five days); 62 construction trips of female three were observed, about two-thirds of them also concentrated in the first 3 days.

Though one sometimes gained the impression that the males also were taking an active part in nest construction, the main work was done by the females. The male's part was that of a stimulator or instigator rather than one of active cooperation. All the males' activities during nest-building seem playful compared with the



(*Left*) MALE TWO AND FEMALE TWO ON IRON GIRDERS BEFORE THEIR NESTING HOLE (BETWEEN CROSS AND ARROW). (*Right*) FIFTEEN NATURAL NESTING HOLES OF TERSINA IN A STRONGLY WEATHERED GRANITE BANK ALONG ROAD. ONLY THE HOLE MARKED WITH AN ARROW WAS OCCUPIED IN 1953 WHEN THE PICTURE WAS TAKEN. PHOTOGRAPHS BY E. SCHAEFER.

strongly directed activities of the females. The females were also more secretive and cautious during nest-building, whereas the males were tame and even heedless. In spite of the fact that the "searching" instincts of the males had not yet completely died away, the females played the leading rôles.

The average nest-building day passed as follows: 6 to 6:30 a.m., first the male, then the female, arrive in territory. They sit close to nesting site; at short intervals, the male sings or both call to each other. After half an hour or a little longer, the female flies away to collect nesting material. The male follows.

Material is collected in the immediate neighborhood of the nesting site (within 10 to 60 meters), mostly in second-growth behind the Rancho Grande building, but sometimes also in empty rooms. No great stress is laid on the selection of any special material.

On April 2, a voluminous, ball-shaped nest of *Pachyramphus rufus* of the year before was looted and systematically taken to pieces between 7 and 9 a.m. The following birds, which were all simultaneously constructing their nests, took part: *Tersina viridis*, female one, male one, and female two; *Pachyramphus rufus*, female; and *Myiarchus tuberculifer*, sex undetermined.

After each 5 to 10 minutes, the female generally returns, closely followed by her mate. She usually carries a thick bundle of loose, dry material and, often without alighting, flies directly and very rapidly into the nesting hole where she remains from 2 to 3 minutes.

The male generally carries "blind" material. Very often this consists of green blades of grass, flowers, umbels, little sticks, etc., all material which is not, or only very rarely, used for construction. The male then either sits before the entrance to the nest and sings with his "show" material in his beak, or enters the nest and comes out again still carrying the material. Seldom does he leave it inside the hole. Often he lets it fall. Sometimes he carries it to another hole and leaves it there. All this is done without system. The female leaves the nest like a flash, always using the same route, and the male immediately follows her, often still carrying "his" material in his beak. In nearly all construction trips to and from the nest, the male is the faithful and ever playful companion of the industrious female. Though the male does not share the "work," he nevertheless is always active. Often, when the female rests between construction trips, the male flies back and forth to the nest carrying blind material or singing. All this activity may lead to the false conclusion that the male is even busier in construction work than the female.

The nest-building activity usually continues until 9:30 or 10 a.m. Then both birds leave the territory (male following the female) for

foraging. Half an hour later construction work is resumed and continued till noon or, during the first days, even up to 2 p.m. Construction activity during the afternoon, 3 to 5 p.m., was only observed on the first, second, and third days. At most, 3 or 4 trips were made during these two hours.

In the course of the last two days of construction, quantities of fine black palm fibers are carried in. At this time, the female remains in the nest for 3 to 5 minutes; the weaving and cushioning with the fine inner lining apparently takes more time than the rough construction of the base.

Until the whole nest is finished, the male still brings blind material, particularly of light color.

Generally the tersinas accustom themselves quickly to the presence of humans in the neighborhood of their nests. When illuminated with flash lights in their nests, they usually make no attempt to escape, but remain completely still. Only one of the "natural" nests (5) was deserted after inspection, probably because some loose earth had fallen on it and partly covered the burrow.

Exceptional Observations during Nest-building Time.—April 1, 1952: 9 a. m., male one passes real construction material (inner bark) to female one on iron girder. Female one enters with material and obviously uses it for construction. Construction activity is continued in spite of heavy fog.

April 2: 7:29 a.m., male two enters nesting hole first, female two follows one minute later, both carry material. 7:33 a.m., both come out *without* material. Then male two catches insects and feeds them to female two.

April 3: 10:22 a.m., first female two, then male two, both with material, enter their hole. They remain inside six minutes, and I hear loud twittering several times. No other such observation was made.

April 4: 8 a.m., an unknown female arrives. Immediately pair one and pair two interrupt their construction activity and, curtsying, drive the strange female away. 9:23 a.m., male two "demonstrates," with black-mask-effect, in one of the neighboring holes. Female two leaves her construction material and "blindly" follows the male. 10 a.m., male two seems to carry material only if female two sees it. He still has the custom of "hovering" and "demonstrating" before other holes. 5:58 p.m., male one still demonstrates at this unusual hour; female one is absent.

April 6: 8:20 a.m., after finishing her own nest, female one "visits" the nesting hole of female two. While female one enters, female two waits quietly outside showing no excitement whatever. After female

one comes out again, female two curtsies four or five times and drives female one back to her own territory.

Consistency of Nests.—The nests of tersinas are loosely constructed, rather shallow cups with irregular, not circular, bases. They are always sufficiently cohesive to be removed from the holes in their original form. They are composed of two layers. The outer is roughly built and of light color. It reaches to the upper rim of the nest, where it is 3 to 4 times thicker than in the center of the nest. This layer consists of vines, creepers, moss, and especially the inner bark and the cambium of various light-wooded trees. The finely interlaced inner layer is a rather compact fabric of tiny palm fibers, which resemble roots. Though the material used in the outer layer is subject to great variation according to altitude, climate, biotope, etc., that used in the inner layer always appears to be the same.

Old nests do not, as a rule, serve as bases for new ones. Only one exception was found at the lower limit of distribution (500 meters) where favorable nesting sites were rare.

The nests show marked differences in shape, size, and weight, apparently an adaptation to differences in the altitudinal levels (500 to 1,000 meters), with their different climates. This is clearly shown in the following table:

WEIGHTS (IN GRAMS) AND MEASUREMENTS (IN MILLIMETERS) OF TERSINA NESTS BUILT IN APRIL, 1952, AT DIFFERENT ALTITUDES AND UNDER DIFFERENT CLIMATIC CONDITIONS

500 meters, deciduous forest

Average yearly temperature ±24° C. Average yearly rainfall ± 1,000 mm.

Weight[1]	*Circumference*	*Diameter*	*Height (rim)*	*Depth of cup*
5.0	28	12	2.5	2.0
5.5	29	10	3.5	2.0
6.7	31	10	4.0	2.5
11.0	35	10	4.5	3.0

1,000 meters, Rancho Grande

Average yearly temperature ±18° C. Average yearly rainfall ±1,800 mm.

Weight	*Circumference*	*Diameter*	*Height (rim)*	*Depth of cup*
8	39	13	5	3.0
13	45	14	5	3.0
26	38	13	5	3.6
14.6	37	12	6	4.0

[1] All weights are taken of the dry material.

The following table gives us weights (in grams) and measurements (in millimeters) of first, second, and, in one case (pair one), third nests of the same breeding pairs at Rancho Grande in different months and under different climatic conditions.

	Pair one			*Pair two*		*Pair four*		*Pair five*	
	April nest	*May nest*	*June nest*	*April nest*	*June nest*	*April nest*	*June nest*	*April nest*	*June nest*
Weight	8	22	25	13	22	26	40	14.6	34.5
Circumference	39	41	45	45	54	38	55	37	41
Diameter	13	14	14	14	16	13	18	12	14
Height	5	5	7	5	6	5	7	6	7
Depth of cup	3	3	3	3	3	3.5	4	4	3

At low elevations (between 500 and 600 meters), the nests of tersinas and their cushioning are much more uniform than the nests of Rancho Grande. The rim is always intricately interwoven with the outer layer. This consists of pieces of bark and macerated wood of dead dicotyledonous trees (15 to 20 cm. long and 2 cm. broad); strongly macerated wood of monocotyledonous trees (12 to 18 cm. long and 2 cm. broad); strips of macerated palm wood (10 cm. long and 1 cm. broad); grass stalks, grass blades (*Panicum maximum*), wool of silk-cotton tree (*Ceiba pentandra*); much-twisted tendrils of Cucurbitaceae (20 to 30 cm. long), sometimes also skins of ameiva lizards and feathers of doves (*Leptotila verreauxi*). All nests at low elevations are transparent in the center. In the nests at Rancho Grande (1,000 meters), there is much greater variation in size, shape, and choice of materials. The base is extraordinarily heavy, and not only is three to four times thicker than those of nests at lower altitudes, but often has no definite shape and structure. No nests here are transparent in the center. The construction is untidy with a great assortment of material, such as liverworts (Hepaticae, Jungermanniales), lichens, many mosses, whole wisps of dried *Panicum maximum*, clusters of *Panicum* roots with stalks (25 cm. long, 3 to 4 gms. in weight), xylem and macerated leaves of dicotyledonous trees, twigs of Casuarina (nest four completely built of this material), chicken feathers, and feathers of swallows (*Pygochelidon cyanoleuca*). The outer layer is always thicker than the inner layer. In two cases the inner layer of black palm fibers was almost entirely lacking. The second nest of pair four consisted only of very dirty creepers, tendrils (30 cm. long) of Vitaceae, with a little moss as the inner lining.

In summary, the nests at lower elevations and those made during the drier months are lighter, smaller, and much less massive than those at higher elevations and those made during the wetter months. This is undoubtedly a direct adaptation to climatic differences.

Mating.—With the exception of pair three, where a copulation was observed on the fifth day of nest-building, mating generally begins only after the nests are completed. According to my observations, the mating period lasts about 4 to 6 days. During this time both males and females are extremely shy. Though the nests are rarely visited,

the males sing more than during nest-building time. Males and females are nearly always seen together. No mass curtsy dances were observed. Both partners seem to be more closely attached to each other than during any other time of the breeding season. The males always follow the females. Frequently the birds were seen in their territories even between 1 and 3 p.m.

Copulation was observed only inside the territories, mostly on vantage points, as in tree tops, the flat roof, and iron girders. The usual time for copulation is between 7 and 11 a.m.; only one copulation was observed between 4 and 5 p.m.

The act is often inaugurated by ceremonial play on a flat surface, either on the ground or on a roof. With drooping wings, the male hops toward the female either from behind or from the side; then he opens his bill widely as if yawning and regurgitates fruit or insect pulp. The black mask is ruffled. Then, wings still drooping and tail tilted, he trips closer and feeds the female from behind over her back. While receiving the food, the female bends her head back and sits completely still. Then she gives the food back to the male. This latter act is often more conspicuous than the reception of the food; one sometimes has the impression that the female is actually feeding the male. Copulation either takes place immediately after the feeding ceremony, or the female flies a short distance with slowly flapping wings, male following in the same butterfly-like manner, uttering thin twittering notes.

During copulation, the female crouches down, flapping her wings; the male, also flapping his wings, covers her for 2 to 3 seconds. Trilling mouse-like notes are uttered. Most copulations are single acts, although in one case, I observed it repeated four times. After copulation both birds often sit close together for 15 minutes to half an hour. In one exceptional instance (pair one), the male flew into the nest and was immediately followed by the female. Both birds stayed inside for six minutes.

Egg-laying.—The span of time between the conclusion of the construction of the nest and the laying of the first egg varied with the different pairs from four to seven days. The daily examination of nests was accomplished with the help of hooked wires, with which the nests could be cautiously lifted in the rear to permit inspection.

During egg-laying, the behavior of the birds changed again. The males, with the exception of male three, became quite indifferent to the females, and mass curtsy plays were common during the activity hours.

With male one, the nest-searching instinct cropped out again for one or two days. Again he hovered from one dark hole to the next, often

sitting in front of one peering about, as though waiting for his (or another) female to be attracted. He also showed the mask effect and "demonstrated" with a blade of grass in his beak, sang a soft, muted song, and tried to copulate again, which the female did not permit. At this time, female one showed no interest in her male. After the laying of the first egg, male one sat on guard on an iron girder while his female was in the nest.

The females were usually seen alone during egg-laying time. They spent large parts of the forenoon sitting quietly near their nests. They lost their suspiciousness and could be approached very closely.

Several times in the afternoon hours, I observed males and females together on the flat roof of the Rancho Grande building. The females were then busily picking small particles from the cement walls. Male and female three were often seen together on their grapefruit tree during activity hours. All males and all females still roosted outside of their territories.

With the exception of female one (who laid two eggs in the first, three in the second, and only one in the third clutch), all females laid three eggs (14 records of different nests). The eggs are porcelain-white in color. The shells are very thin; seen against the light, the yolk is visible, giving a suffusion of light orange in the center of the fresh egg. The variation in shape and measurement of the eggs is considerable. One egg from 500 meters measured 21 × 14 mm. and weighed 1.75 gm. Four from Rancho Grande measured 22 × 16.5, 23 × 15, 20 × 15, and 20 × 14.5 mm. The last two were in the same clutch. The first two weighed 2.7 and 2.9 gm., respectively.

The great majority, if not all, eggs are laid between 7 and 9 a.m. For the purpose, the female remains in the nest for about one to one and one half hours. However before laying her first egg, female three entered the nest at 6:10 in the afternoon and stayed in the nest until 9:40 the following morning. The span of time between the laying of the different eggs varies individually. Females one and two laid theirs on consecutive days, with 23 to 26 hours between eggs. The obviously younger females three and four laid their eggs every second day.

Incubation.—The eggs were incubated between 80 and 92 per cent of the entire time, a very high percentage. The period of incubation varies between 13 and 17 days; the average seems to be 15 days. In most cases, incubation begins after the laying of the first egg. From this time on, the females remain overnight in their nests and only the males leave the territories. The only exception observed was female three, who spent the night outside the nest after the third egg was laid.

From the first to the fourth day, the females leave the nest four to six times a day. From the fifth to the thirteenth day, the females sit nearly all day, leaving the nest only for two intervals of varying length. And from the fourteenth to the sixteenth day, the females leave their nests three to five times a day.

All females sit especially close during foggy hours, although they sometimes leave their nests during even torrential rains. Coming back after the rain they are always dry, indicating that they had been foraging in another, lower, region, as cloudbursts are often quite local.

There is great individual variation in the length of the periods spent by each female outside her nest. During the main incubation period (fifth day to thirteenth day), the female is generally off the nest for two short periods each day: a longer one in the forenoon and a shorter one in the afternoon, both usually during the common activity hours. These are also the only times when the incubating females meet with their males. Then they use a very peculiar greeting ceremony, lifting their wings and stretching their legs. Apart from feeding, the females use this time mainly for preening.

Female one had a tendency to leave her nest for 20 to 40 minutes between noon and 1 p.m., with high outside temperatures of 19° to 24° C. in April. Otherwise the periods of neglect were correlated with the activity hours between 7 and 9 a.m. and 3:30 and 5:30 p.m. Female one left her nest for 15 to 50 minutes at a time. She kept the same rhythm in June, on her third clutch, when the rains were very heavy. However, when outside temperatures dropped to 15° C., especially during times of heavy rainfall, she left her nest usually between 10 and 11 a.m. and 2 and 3 p.m. During "cold" nights she also slept in her nest with her head under her wing. This was never observed with any other female.

Female two sat very closely and left her nest only for very short intervals, usually between 7:30 and 8 a.m. and between 3:15 and 5:30 p.m. The periods of neglect varied from 20 to 40 minutes in the forenoon, and from 10 to 35 minutes in the afternoon. Only on the seventh day of incubation, a very sunny day, did female two leave her nest between 2 and 3:10 p.m.

Female three spent more time off her nest than the other two females. Though she was very suspicious in the neighborhood of her nest, during the entire incubation period she regularly remained away from her nest for 60 to 90 minutes between 7 and 9 a.m. and again between 3 and 5:30 p.m.

In contrast to all other pairs, female three and male three kept intimate companionship during the period of incubation, the male often feeding his female with insects on "their" grapefruit tree.

During incubation, all females were shy and secretive. They approached and left the nest rapidly. However, they never appeared to be disturbed when examined on their nests with flashlights.

While incubating, they always assumed an extraordinary flat posture, sometimes with the body feathers ruffled and often hanging over the rim of the nest. During the day, they sometimes sat sideways, but during the night the heads were nearly always directed toward the entrance hole.

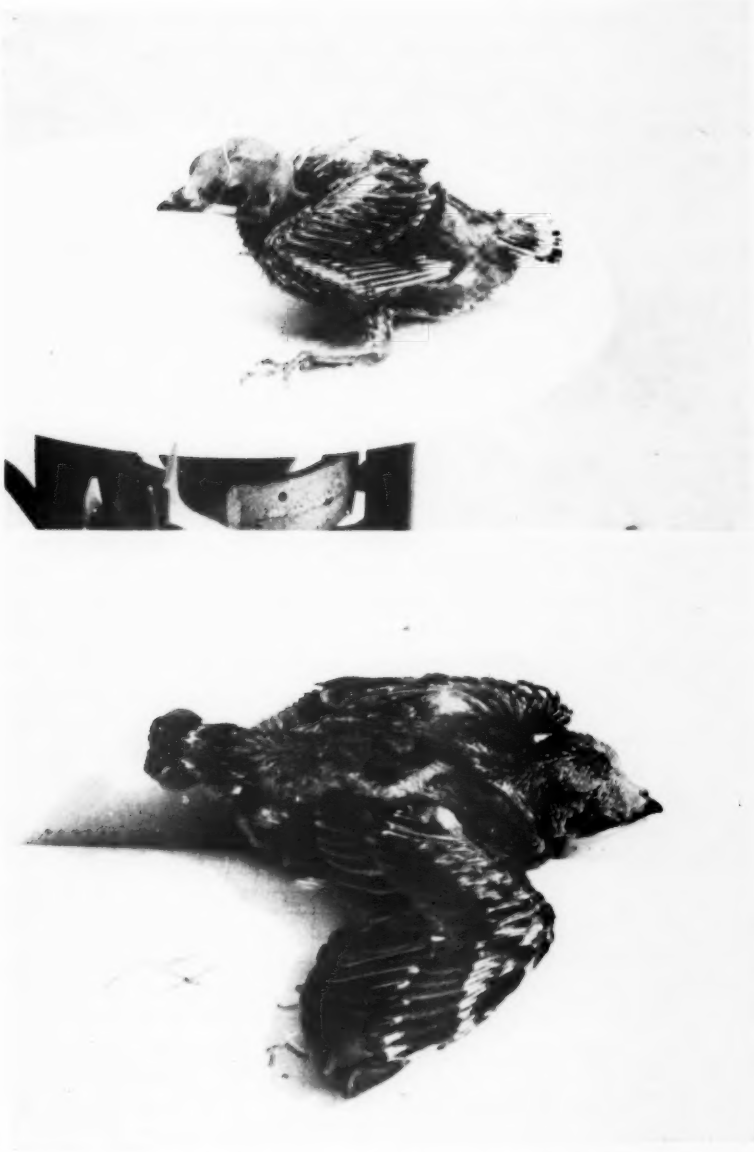
The males never enter the nests during the period of incubation, and no vocal communications between males and incubating females were observed. The general characteristic in male behavior during incubation is estrangement from the females and nests. Most males behave like "bachelors." They sing and call little. During activity hours they occasionally curtsy to each other, but their instinct for territorial defense is weak. They seldom attack mounted birds and often sit quietly together with strangers. When they meet their females, they recognize them at once but do not employ the greeting ceremony as females do. Usually, they sit together with their females in complete indifference. Then the females, after preening, fly back to their nests; the males do not follow.

For days in succession, the males is not seen in the neighborhood of their nests, and they spend only the activity hours in their territories. On foggy mornings, they arrive as late as 8 a.m.

Individual variation with the males are also considerable. Male one used to meet his female quite regularly; male two was the most "unfaithful" of them all, often being absent even during the activity hours; and male three, as was said before, remained most closely attached to his female. Another characteristic of the males during incubation seemed to be the change from a diet of fruit to one consisting mainly of insects. Flycatcher-like insect catching was often observed, but only male three fed his female regularly with insects. With males one and two, the estrangement ceased on the third or second day before the young were hatched. Then they again approached their nests, watching in a rather shy way before the entrance.

Care of Nestlings.—The percentage of young which hatched, in the nests that I had under close observation and which were not disturbed by humans, was nearly 100. I never found an unfertilized egg. With the exception of pair one, whose first two nests were raided by rats (the third brood of this pair died of starvation), and the second nest of pair four, which was disturbed by humans, no losses of eggs or young were observed.

The nestling period lasts 24 days.



(Top) YOUNG, 12 DAYS OLD. *(Bottom)* YOUNG, 16 DAYS OLD. PHOTOGRAPHS BY E. SCHAEFER.

Though the average outside temperatures at 500 meters were at least 6 to 8° C. higher than those of Rancho Grande at 1,000 meters, no difference in speed of the development of young was observed. In respect to relative growth and to the period of time spent in the nest, there was an astonishing conformity of dates. The only noticeable difference observed was that the young of the "lower belt" left their actual nests one or two days earlier, awaiting feedings halfway between the nests and entrance holes. But this was probably due to the fact that the lower "tropical" nests, as we have already stated, were much smaller and weaker than the "subtropical" ones.

No details of the actual hatching process were observed. The young usually hatch on two or three consecutive days. This was proved directly by numerous daily examinations and indirectly by the fact that three eggs of nest 4/2, after 10 to 12 days of incubation, contained embryos in very different stages of development (3 mm., 10 mm., and 15 mm. in length).

I never found an empty shell. As the males do not enter the nests during the time of hatching, they were presumably removed by the females. Whether they were swallowed or carried out, I do not know.

Some of the most striking changes in physical growth throughout the nestling period may be seen in the following table.

The most conspicuous characteristics of the newly hatched young are their enormous heads, their very thin necks, and their tiny bodies. The protuberant nostrils and the traces of the egg tooth are visible during the first days. At a distance, the juveniles seem completely naked, as the sparse natal down on the head and back is of the same yellowish-pink color as the rest of the body, giving the skin a peculiar light golden hue. The flat heads look rather deformed because of the greatly extended bills, with their conspicuous white corners, contrasting with the big protruding eyes.

Instinctive light reactions of young tersinas from shortly after hatching till the third or fourth day are the more interesting as the eyes are tightly closed up to the seventh or eighth day after hatching. During the first two days, the young respond spontaneously with non-directed vertical stretching of the neck and simultaneous bill-opening, when stimulated by the beam of a flashlight. These experiments were often repeated after watching in complete silence before the nest tunnel. On the second day, this reaction was much less pronounced. It disappeared on the third or fourth day.

The first very weak, chiming cries were heard on the second day, becoming stronger from day to day thereafter. From the fifteenth

Age in days	*Color of legs*	*Eyes*	*Bill*	*Head*	*Natal down*	*Pigment of skin*	*Average primary*	*Back*	*Chest and belly*	*Tail*
1	pink	closed, pink	light pink, inside orange	pink	sparse yellow down	pink	naked	naked	naked	naked
3	—	closed, gray	corners to eye 1 cm. white	still pink	on head and back	—	—	—	—	—
5	—	closed, 7 mm. in diameter	—	—	—	—	—	—	—	—
7	—	small slit	—	—	—	—	first gray points visible below epidermis	pattern of tracts visible	—	—
9	flesh	bigger slit	lead color	—	—	orange	elevated gray remiges in sheath 0.5 mm.	tracts of upper legs visible	pattern of tracts visible	spiky sheath 1 mm.
11	—	in activity, open	corners 0.7 mm. white	—	—	—	still in the sheath 10 mm.	sheaths 1 mm.	side-quills 2 mm. bright yellow	sheaths 5 mm.
13	—	in calm, still closed	—	gray quills emerge	only little left on head and back	—	sheath 18 mm. plumage begins to escape 2 mm.	plumage 1 to 1.5 mm.	center still naked	sheath 15 mm. plumage 1 mm.

Age in days	*Color of legs*	*Eyes*	*Bill*	*Head*	*Natal down*	*Pigment of skin*	*Average primary*	*Back*	*Chest and belly*	*Tail*
15	dark lead color	open	corners still 0.5 mm. white	quills dark lead	—	—	plumage 10 mm.	plumage 4 mm.	plumage escapes 2 mm., yellow	total 17 mm. plumage 3 mm.
17	—	—	—	dark lead 2 mm. long	—	light gray	plumage 15 mm.	all green plumage 8 mm.	plumage 8 mm.	total 21 mm. plumage 9 mm.
19	—	—	still very soft	—	—	—	plumage 23 mm.	all green	plumage 10 mm.	plumage 12 mm.
21	—	—	—	—	—	—	plumage 31 mm.	—	all yellowish green	plumage 13 mm.
23	—	—	—	feathers emerge green	natal down disappear-ing	—	plumage 34 mm.	—	—	plumage 15 mm.
24	—	—	corners still 0.2 mm. white	white ring around eye visible	—	—	plumage 38 mm., but sheath still 15 mm.	—	—	plumage 17 mm.

day on, they can be heard at a distance of 30 to 40 meters from the nest. Under natural conditions, these chirping notes were uttered only when the adults were near, or entered the nesting holes, and while the young were being fed. The chorus of united voices continued for one or two minutes after the adults had entered the nest. Even when the adults were away for intervals between feedings, no sounds were uttered by the young. When touched or taken out for inspection, the young were always silent.

From the third day on, they usually responded to sounds (chucking of tongue) with the same still undirected vertical neck stretching and gaping described above. The only differences were that they chimed continuously with united voices, flapped the tiny stumps of their wings, and described circles by moving their heads and necks vigorously.

From the sixth day on, the stretching and gaping were definitely directed toward the light (tunnel entrance). The reaction was easily released by sounds, but not by touching the nest. Under the latter circumstance, the young pressed themselves flat into the nest cavity, showing the first indications of fear.

From the seventh or eighth day on, the young usually faced the entrance, their heads resting on the rim of the nest. Then the white corners of the bills and the pinkish throats were clearly visible. Only while defecating and at night did the young face in the opposite direction.

From the eighth (in one case seventh) day on, the females did not brood at night. This was also the time when the first eye-slits were visible. The aquisition of vision is a slow process (see pp. 440–441). Between the tenth and twelfth days, the eyes were completely open during activity (as when the young were hungry or being fed) but were still closed at times of rest.

Thereafter, many experiments were conducted with pieces of cardboard of different shapes, paper images of adult birds, and mounted tersinas and other birds, including birds of prey. The results showed that the juveniles were not able to recognize their own species or the birds of prey, they did not respond to motionless objects, and they stretched and gaped spontaneously in response to moving objects of any sort with simultaneous changes of light intensity.

From the tenth day on, the young began to clean and scratch themselves.

From the fourteenth day on, they had a tendency to leave the nest during the day to meet the feeding parents halfway between the nest and the tunnel entrance. During the night, they gathered again in

the nest, and during cool nights (outside temperature: 15° C.), they even slept with their heads under their wings. They became very alert, and even shy, and invariably shrank back or dodged when they were inspected.

From the fifteenth day on, the young sometimes, but rarely, answered their parents when they approached the nests with food.

They were most shy before fledging. The last traces of natal down on the heads are lost, in some individuals, only after leaving the nest. The head and tail feathers are fully developed only after the young have started to fly (30th to 35th day). Then also the last traces of the white corners of the bill are lost.

The juvenal plumage, which shows much yellow in the underparts, is gradually lost by very slow, incomplete molt which begins within a month after leaving the nest.

On the sixteenth day, the first silky, glossy green feathers and the gray throat feathers are first seen. With the nineteenth day, the white ring around the eye begins to disappear. After 120 days, the young males look very much like adult females. After 140 days, primaries and secondaries are also changed, and in young males, the first iridescent blue feathers show on the back, tail, and breast. After 200 days, some iridescent blue feathers show over the whole body, but the general color is still green.

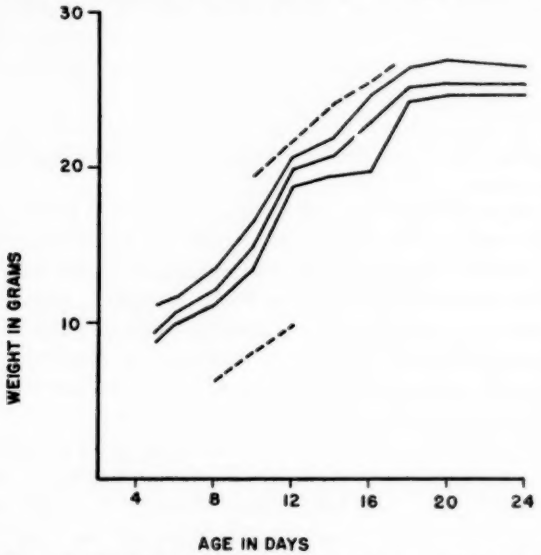
Weight of Juveniles.—As only three nests could be gradually drawn closer to the entrance with the help of wires and as there was danger that the adult birds might leave their broods, the following weight measurements are very incomplete and do not include the whole length of the nestling period.

With nest two, the weighing began on the fifth day after hatching, while the only young of nest 1/1 and nest 1/3 could only be weighed between the tenth and seventeenth, and the eighth and twelfth days, respectively. (See graph.) For weighing, the young were removed with their nest (or later simply taken out of the holes) and individually weighed on a balance and otherwise examined. This daily process lasted only 5 to 10 minutes for each nest.

Nest three, which was favorably situated for close visual inspection, was left completely untouched as a control until the twenty-third day, when the juveniles were banded. On the morning of the twenty-fourth day, as was expected, they flew out. The general rhythm of growth and development of the juveniles of nest three was the same as that of the young of nest two.

Four rather distinct periods of growth could be distinguished. During the initial period, lasting from the first to the fifth day of post-natal

development, only visual observations could be made. Noticeable development did not begin before the second day. But the relative growth seemed very rapid. The great difference in size of the young of one brood just after the hatching of the last young, became less noticeable from day to day. Nevertheless, there was a decided difference in weight between the smallest and the largest until at the thirteenth or fourteenth day, when a strongly-marked period of



Weights of juvenile Tersinas. Solid lines, young of nest two; broken lines, young of nests 1/1 (upper) and 1/3 (lower).

fluctuation began. During the first five days, the single young of nest 1/1 appeared to be about three times larger than the young of nests two and three; later it grew more rapidly, and during the time it was weighed daily, it proved to be much heavier than the heaviest juvenile of nest two.

During the second period, from the fifth till the thirteenth day, the development was relatively uniform and rapid, but the increase in weight varied individually and according to the storage of food in the esophagus.

The third period, one of rapid feather sprouting, lasted from the fourteenth to the eighteenth day, was one of less increase in weight, and was marked by great fluctuations.

During the fourth period, the eighteenth to the twenty-fourth day, only very slight further increase of weight was observed; in two young, even a slight decrease was observed shortly before leaving the nest.

Brooding.—After hatching, brooding and feeding activities are completely interwoven at least until the eighth day. During the first three or four days, the females invariably remain a long time in the nests, after returning from their food-collecting trips. They seem to feed only a part of the food contained in their throat-pouches at a time. They can be observed brooding for hours with throat-pouches still full of food. Though I have no conclusive evidence (as the females hesitate to feed in the beam of a flashlight), it is probable that they feed several times before leaving the nest again with empty pouches. There is, of course, the possibility that the brooding females regurgitate the food stored in their throat-sacs, to swallow it, or parts of it, themselves.

The juveniles themselves store so much food in their esophagi that till the 10th to the 13th day, they look enormously inflated, bulging out to one side of the throat. This strange faculty also seems responsible for oscillations in weight of between one and four grams. After the fourteenth day, I observed no further evidence of food storage in the young during the day. This may be due to the more rapid metabolic rate during the time of maximum feather growth. From this time on, the juveniles seem to be hungrier than before. On the tenth day, I obtained the first evidence that the young of nest three attempted to feed themselves or at least tried to swallow cherry-sized fruits brought in by the male.

The storage of food by adults as well as by juveniles is certainly an adaptive measure against the torrential tropical rains, which often prevent for hours the collection of food for the young.

The females brood more closely during the great rains. This indicates that the brooding rhythm after hatching is mainly controlled by outside temperatures, which fall from 2° to 3° C. during cloudbursts.

On the morning of May 6, when the outside temperature dropped from 18° to 15° C., none of the females left their nests before 8 a.m. On the other hand, with fine weather and high temperatures, I often saw the heads of the juveniles protruding beside the brooding females. Depending strongly on weather conditions, the number of hours of brooding can be extremely irregular on two successive days. However, there is no doubt that they decrease gradually up to the eighth day. On the first day, the female broods nearly continuously with only two or three intervals of 5 to 40 minutes in the morning and early afternoon.

Following is a summary of the length of time spent by females in brooding: first day, ± 22 hours; second and third days, 16 to 20 hours; fourth and fifth days, 15 to 18 hours; sixth and seventh days, 14 to 17 hours; eighth and ninth days, no more brooding.

Though the juveniles are still nearly naked, the change from brooding by day and night to leaving the juveniles over night without cover is very abrupt. It generally takes place on the eighth day.

Feeding of the Young.—The main task of feeding the young falls to the female. As the feeding activities differed in many respects at the various nests, details are given below. The numbers shown should be considered as approximate, as these observations were made by four different observers.

Pair one, nest one (May): only one young, which was killed by a rat on the seventeenth day after hatching. Though the male entered once on the fifth day, when the female was brooding, it fed the young only from the thirteenth day on. Approximate number of feeding trips: first to twelfth day, 97; thirteenth to seventeenth day, 94 (12 of which were by the male).

Pair one, nest three (July): only one young, which died of starvation on the twelfth day. Approximate number of feeding trips: first to twelfth day, 28 (only one feeding by male when female was inside nesting hole).

Pair two: three young, fed by the female only, during the first eight days. Approximate number of feeding trips: first to twelfth day, 229 (35 by the male); thirteenth to twenty-fourth day, 463 (150 by males 2 and 2a).

Pair three: three young. The male started feeding them on the third day. Approximate number of feeding trips: first to twelfth day, 220 (100 by the male); thirteenth to twenty-fourth day, 527 (220 by the male).

Pair four: three young. The male started feeding them on the thirteenth day. Approximate number of feeding trips: first to twelfth day, 200 (all by the female); thirteenth to twenty-fourth day, 511 (215 by the male).

NUMBER OF FEEDING TRIPS FROM HATCHING TO FLEDGING

Pair Number	*Number of young*	*Number of Trips by male(s)*	*Male started feeding Young*	*Number of Trips by Female*	*Total Trips*
2	3	185	Ninth Day	507	692
3	3	320	Third Day	427	747
4	3	215	Thirteenth Day	496	711

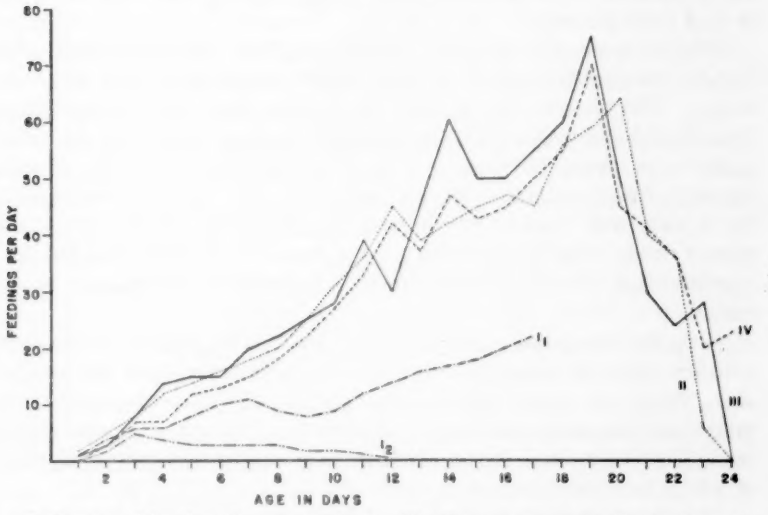
The rhythmic increase and the variations in the number of feeding trips can be best seen in the graph, in which the numbers are only approximate.

It may be added that during the first days, the intervals between feedings often amounted to many hours; this was true also during the last two to three days before leaving the nest. The long intervals in

(*Left*) YOUNG AFTER FLEDGING, 24 DAYS OLD. (*Right, top*) YOUNG CAPTIVE MALES, 45 DAYS OLD. (*Right, bottom*) YOUNG CAPTIVE MALE PERFORMING GREETING CEREMONY. PHOTOGRAPHS BY E. SCHAEFER.

the first days may be explained by the smallness of the young and their ability to store food. The intervals of the last days, however, may be interpreted as an attempt to "compel" the young to fly.

Besides the relationship between relative age (or growth) of the young and the number of feeding trips, there are also correlations with weather. With fine weather, feeding begins at 6 a.m. and ends at 6 p.m., with approximately the same number of feeding trips in the



Daily rate of feeding of young tersinas. The Roman numerals refer to the nests.

morning and afternoon. As the mornings are usually clear and sunny, there is generally less variation in feeding activity before noon than in the afternoon, when rains and cloudbursts are heaviest and most abundant. The maximum feeding activity was observed one or two hours *before* cloudbursts (eight or nine times per hour); the minimum, during continuous rains (three or four times per hour). Exceptions were observed on fine sunny afternoons when activities were even greater than in the preceding forenoons. This was probably due to the high outside temperatures with simultaneous abundance of flying insects.

With the exception of flying insects, which are usually caught inside the territories and which are immediately fed to the young, the food for the young is nearly always brought from far away. On several occasions, I observed females covering distances of 300 to 400 meters to collect fruit.

The males as a rule did not participate in these long collecting trips. They stuck more or less to their territories. The adult birds always used the same routes in approaching and leaving their nests. These flightways never led over open ground. The birds always took advantage of the smallest cover, such as bushes, trees, and walls. Before entering their burrows, they often alighted near by, waited for some minutes (if feeling insecure, they even waited with bulging throat-sacs for 15 to 20 minutes) and then rapidly flew into the holes to feed their young.

Judging from the relative volume of their throat-pouches, the females invariably brought a much larger quantity of food than the males. The females also played the leading rôle. Only very exceptionally did the males make independent feeding trips. In the great majority of cases, both partners arrived together, the males always following the females. Then the male invariably waited outside until the female had finished feeding the young and had left. The male stayed inside only half as long as the female. I often had the impression that the male only acts as a follower or companion of his female.

With the exception of male three, the males joined the feeding activity when the young had grown to such an extent that the females alone could not supply the demand for food. So it could easily be predicted that male one, which had only one young to care for, would begin his feeding activity much later than males two and three, each of which had three young.

Also there was a great deal of individual variation among the different males in the degree of attachment to their females. Male three, which was most closely "united" to his female, was also the earliest to share in the feeding activity. Since male three fed his female much more frequently than the other males and often entered his nesting hole when his female was inside, it is very probable that he also fed his female when she was brooding. With males one and two, the feeding activity was inaugurated by first feeding their respective females with insects. This was done in a rather "shy" way, two or three days before the males fed their young for the first time.

The males still engaged in their curtsy play during activity hours, even when food demand was at its maximum and feeding trips had reached their greatest frequency.

They always preferred to bring insects, which they could catch on the wing. If males brought fruit at all, they tended to collect the easiest obtainable, Cecropia seeds or whole lauraceous fruit, with which they first played, as described earlier. In one instance, male one

brought one of these fruits and after 20 minutes of playing with it on one of the iron girders, he cut it into small bits and fed it all to his female, who had just arrived with food in her own throat-pouch. She then entered the nesting hole to feed the single young, while her mate flew away.

Before beginning their own share in feeding, the males were very timid. Often it seemed that they wanted to follow their females into the nests, but that they somehow were stopped from doing so by an unknown psychological factor. At this time I also saw the males' throat-pouches filled with large insects. They hovered undecidedly for three to five minutes in front of the entrance holes of their nests before they finally dared (or dared not) to enter.

On the fifth day after the eggs hatched, male one (nest one) sang with insects in his bill before clinging to the nest entrance. Then female one came out of the nest, where she was brooding the young, and her male tried to copulate.

The act of feeding the young could be observed only in nest four, which was situated only five centimeters inside the wall of the building. After the nest entrance had been enlarged with a chisel, I was able to see with strong field glasses directly into the nest from the opposite slope, a distance of 15 meters.

At nest four, the female invariably came first. Generally she alighted on the rim of the nest for one or two minutes. She gave equal shares to all three young. A few seconds after she had left, male four arrived and invariably fed only one young; accordingly he stayed a much shorter time in the nest before following the female.

Defecation.—After feeding the young, the adult birds leave the nests extremely rapidly and the surroundings were difficult to survey, so little definite knowledge was gathered on the question of whether and for how long the adult birds swallowed the droppings of their young. My observations on this were again made at nest four.

During the first six days, it seems that the females, who nearly exclusively feed during this time, swallow all or nearly all droppings. From then on, the feces, which are enveloped in a gelatinous cover, are carried away by the female after each feeding and less frequently by the male. After leaving the nests with the excrement in their bills, the adult birds first invariably drop down, fly very low, and after about 10 to 20 meters, let the droppings fall.

The parent birds never wait for the defecation of their young. In the early morning hours, one usually finds a row of droppings lined up on the front rim of the nests. These droppings are carried away, one after each feeding. The individual young appear to def-

ecate every one to two hours during the day. Before doing so, they turn the anus toward the light, make a bow so the anus points out straight into the air, and deposit the dropping on the rim of the nest. Defecation stops at 9 to 10 p.m.

The individual droppings are large, and they vary considerably in size, weight, and color. If the predominant food consists of insects, the droppings are dark gray, bluish, or purple, with a big white rim of albumen; they measure 20 to 30 mm. long and 3 to 5 mm. thick, and they weigh 0.3 to 0.7 gm. When the diet is mainly fruit, the droppings are dark green or yellowish, with only very little white. They are 35 to 40 mm. long, 0.3 to 0.5 mm. thick, and weigh 0.4 to 0.8 gm.

The continuous analysis of fresh droppings during the daily cycle as well as during the entire nestling period, has shown interesting irregularities: in the morning and early afternoon, the food is predominantly (80 to 100 per cent) fruit; in late afternoon, the food consists chiefly of soft, flying insects, especially Diptera and Hymenotera (75 to 100 per cent). This relationship depends largely on daily weather conditions and the habit of the tersinas of catching insects in the late afternoons, if the weather is fine. After excessive rain, the evening food consists mainly of fruit, sometimes even entirely of Cecropia, which under normal conditions is fed only by the "lazier" males.

During the first six days, insect food predominates, while between the seventh and fourteenth days at least 40 per cent fruit is fed. From the fifteenth to the twentieth day, the main period of feather sprouting, a change from fruit to insect food was noticeable, while during the last days before fledging, the food consisted chiefly of fruit.

Second and Third Nestings.—Only one second brood was observed under completely natural conditions, though the males were still in breeding inclination and faithfully stuck to their territories after the young had fledged. If the first nest, with eggs or juveniles, was destroyed, the birds began to build a second nest, usually in the same territory. Sometimes the territory was enlarged in the direction of the least biological resistance.

The second nest of pair four, a very large, untidy structure, was built in only four days. But as a rule, the instinctive actions involved in second and third nestings are slower and less pronounced than those of the main breeding period. Also, the curtsy activities of the males gradually diminish.

Leaving of the Nest.—While in 1950 and 1951 the majority of juveniles fledged between June 15 and 25, in 1952 almost all left during the last week of May.

The young of all nests under observation in 1952 left the nest between 6:45 and 9 a.m. They never returned to their nests. Though they were able to fly for 40 or 50 yards, they were easily recognized by their flat, scantily feathered heads and short tails.

During the first day, they usually sat quietly on branches of middle-sized trees 50 to 100 yards from their nests. They were generally fed by the females, while the males alternately protected them actively against birds of the same or other species and flew back to their territories.

By the second or third day, they leave the territories, accompanied by their mothers, for lower regions. Only one case was recorded in which a banded juvenile, which fledged on June 3, returned on June 18 with three unbanded juveniles (not hatched at Rancho Grande) and an adult female.

After leaving the young by themselves 8 to 10 days after fledging, the females return to their territories to join their males. The males do not follow their females and young but remain in their territories. As soon as their females return, they try to induce them by "searching" demonstrations to start a second brood, but they are seldom successful.

Then, during June, the breeding and territorial instincts of the males slowly die away, and they all join the juveniles in flocking. These changes, doubtless under hormonal control, seem to be mainly regulated by temperature: a comparatively short spell of bad weather with heavy rains and low temperatures actually extinguishes the breeding disposition even in the old males. Tropical birds are as a rule much more sensitive to small temperature variations than are birds of temperate zones.

Flocking.—Single acts of aggression or defense against other species of passerine birds are now very common. They are soon coordinated with a completely different behavior which quickly culminates in a very strong species consciousness. The tersinas congregate in companies of 10 to 30 individuals, with strong social ties, which were absent during the breeding season. Thenceforth they are never seen in company with other passerine species (unlike Furnariidae and tanagers, which after the breeding season form mixed flocks of up to 25 species). Even stronger and bigger birds, such as *Thraupis espiscopus*, *Thraupis palmarum*, and *Tyrannus melancholicus*, are then often vigorously fought off and sometimes followed with open bills and hissing noises.

All tersinas now adopt a very pronounced "follow-me" reaction which regulates the movements of the flocks. These flocks move from one high tree top to the next in a loose order, often covering great dis-

tances. Often they follow insect swarms. Even the old males act just like ordinary members of the flocks without assuming a leading position. There is little individual freedom in these tersina flocks.

Between June 2 and July 6, one large flock visited the high (50 m.) tops of *Gyranthera caribensis* trees in front of the Rancho Grande building every afternoon.

The last single tersina in Rancho Grande, a female, was seen on July 17, 1952. At 500 meters the last bird was observed July 20.

Individual Characteristics and Exceptional Behavior of Different Pairs.—Pair one: May 13, noon, the only young of this pair is found dead in entrance to nesting hole. The juvenile had left the nest on May 10, when it was fourteen days old. The dead young is half eaten by a *Rattus norvegicus*, which probably killed it. During the afternoon female one lost her instinctive feeding shyness; she sat passively on iron girders in front of the nest entrance. Male one also changes his behavior after a few hours. He is always present, does not leave his territory during the whole afternoon, and often sits beside the "mourning" female and sings for hours without interruption.

Between 4 and 6 (activity hours), both birds are extremely restless and often trespass into other territories. It seems that territorial boundaries have no significance to the pair. The female leads, always followed by the courting and singing male. Through this behavior, the whole breeding community falls into disorder. Males two and three leave the feeding activities of their own young entirely to their females, who do not join in the general excitement. A one-hour, very hostile curtsy duel between males one and two and male three takes place on the uppermost roof of the building, and no territorial boundaries are observed by any of the males. The site of the duels is determined by mourning female one, who is continuously followed by all three males. Also young male four timidly tries to participate, begins to curtsy, but is immediately driven away by the three old males. During most of the time, female one sits quietly preening, often surrounded by the three duelling males. At 6:12 p.m., female one and all three males fly down to spend the night outside the Rancho Grande island.

May 14. Female one arrives at 6:05 a.m. and flies, followed by male one, to the old nesting site, where she sits passively while the male sings two yards away. Males two and three are again feeding their own young and the "old order" is restored. No further territorial invasion by female one takes place. Actions of female one determine the behavior of the males. At 7:40, male one stops singing and very actively begins searching for a new nesting site about 4 to 6 meters from the old nest. Female one remains passive. At 10 a.m., both birds vanish and do not return until 3:30 p.m. From 4 to 5:30 p.m., male one searches and demonstrates with stalks in his bill, but the female still is completely indifferent.

May 15. At 7:05 a.m., male one demonstrates and carries little stalks close to his female, who still shows no reaction and at 7:14 flies off, immediately followed by male one. At 7:16 a.m., female one again arrives, followed by the two-year-old light gray bachelor male (number 2a). This male immediately begins searching and hovering between all the holes which surround the still sitting female one. Male one returns at 7:21 a.m. and throws himself at once on male 2a, drives him out of the territory, and alights several centimeters from female one. Then they both fly to the avocado tree where they quietly sit for an hour close together: a new "engagement" seems to be accomplished.

During afternoon activity hours, male one demonstrates again and female one responds to the black mask effect. New nesting site is selected. May 16, building of second nest begins; May 22, nest completed; May 23, copulation observed; May 26, first egg; May 27, second egg; May 28, third egg; May 29, 6:00 p.m., rat is surprised eating all three eggs; rat charges and bites observer's finger.

May 30. 6:20 a.m., pair one arrives and without paying further attention to old nesting site, immediately chooses new one on lighter, more open, and less damp southeastern front of building, only 15 meters from the avocado tree. The female leads; at 7 a.m., after hovering, she enters a 2.5-meter hole in wall, which contains a swallow nest (*Pygochelidon cyanoleuca*) with three nestlings which are nearly ready to fledge. Female one remains 17 minutes in the swallow nest while male one sits on wire one meter from hole. Both adult swallows are circling around, timidly shrieking but not attacking. 9 a.m., one adult swallow enters the hole to feed her young. Female one follows the swallow, drives her out and chases her in three large circles around the territory and then away. Then female one alights on the avocado tree, where male one has been sitting quietly for a long time. The fight between the attacking female one and the two adult swallows continues all day long. Male two does not participate in this final fight for the nesting site but has a very vigorous curtsy duel with four unknown adult males, which come up at 4:30 p.m. and are all beaten off and out of his territory. In the evening the swallows still occupy their nest. Both adult swallows are, as usual, brooding their young over night.

May 31. Fight against swallows continues all day. Now male one also joins in, enters the nest hole at 7 a.m., and soon afterwards demonstrates with stalk in bill. Again the adult swallows circle for hours around the nesting hole, probably to induce the young, which have already left the nest, to fly out. The fight ceases at 4 p.m., when male one and his female both join in curtsy duel with strangers. Then, usual pebble-flicking on the roof follows. At night the swallow family is still on the nest. June 1 and 2, fighting continues in the same way, outcome still undecided; it seems as though the tersinas will wait until the young swallows have flown out.

June 3. Immediately after the young swallows have flown out, between 6:30 and 7 a.m., female one begins building nest. The material is brought from the same place, behind the building where material for the first two nests was collected. Nest-building activity ceases at 9 a.m. (wind, rain, drop of temperature to 16° C.). At 5 p.m. when the young swallows fly to their old nest again, they are immediately attacked vigorously by male one, who follows into the hole. After 3 or 4 minutes, male one drags out a young, already half-dead swallow, holding it by the throat. He throws the young swallow to the ground, follows, and strangles it on flat ground. During this last phase of the "murder," female one has approached to within 20 centimeters of the scene and watches it. The adult swallows again circle around without actively defending their young. After the "murder," male one sits on the avocado tree during heavy rain and sings several times. But again both adult swallows and the two remaining young enter the hole and spend the night inside.

June 4. Swallows fly out at 6:15 a.m., before the tersinas arrive. Both tersinas are now very tame, as place in front of nesting hole was much used during last days as a parking space. Flushing distance has now diminished to about 3 or 4 meters. Nest building by female one continues, but is much slower than it was with first and second nests. Between 8 and 10 a.m., only four construction trips are observed. Nest three is constructed on back wall of the hole, 0.3 centimeter behind swallow nest. During the building activity of female one, male one sits inactive on wire before nesting hole. No singing. No construction in the afternoon. After tersinas have left at 6:05 p.m., the swallow family again enters hole and sleeps in nest.

June 5. Nest-building activity still slower than on preceding day: only from 8 to 9 a.m. After interruption for my own breakfast, second young swallow is found dead on ground in front of nesting hole (same place where first young swallow was killed by male one). The three remaining swallows (two adults and one young) do not sleep in nest again.

June 6. Rain, storm, 15° C.: no nest-building activity; male one arrives alone at 9 a.m. and demonstrates with stalk in beak.

June 7. Fine sunny day, 24° C., great building activity: 8 to 10 construction trips between 8 a.m. and noon. Male one joins in and follows female on each trip behind the building (50 to 70 meters distance) but carries only one third as much as female. Female often brings thick bundles of grass and inner bark of Cecropia and Miconia. These bundles are often larger than her body and hang 20 to 25 centimeters behind like little streamers. Before flying into the hole, both birds always alight on the avocado tree, then on wire in front of nest. Male always enters 3 to 4 minutes after female, often reappears with material, plays undecidedly, demonstrates, etc. Yet male one actually seems to take part in construction work. This is proved by inspection with a flashlight after both birds have been in the nest ten minutes: while female sits on the rim of the new nest, the male makes weaving movements; he was not disturbed by the light. All of the material of the swallow nest is by now used by the tersinas to build their new nest. After two or three minutes, male one tries to escape, flies against my hand, then squeezes through my fingers, alights on the avocado tree, and immediately begins to sing. Female one, as usual, remains in the nest, leaves after seven more minutes. No nest building in the afternoon. During activity hours, 4 to 5 p.m., both fly to old nesting site, then indulge in pebble-flicking on the roof. 5:15 p.m., one whole hour before sunset, both fly "down."

June 8. Last observed building activity, only by female, 8 to 10 a.m. Male alternately sings on wire in front of nest and demonstrates with stalks in bill.

June 9 to 12. Both birds shy, copulation twice observed.

June 13. The only egg is laid, female on nest from 7 to 10:30 a.m., male not visible.

June 14. Female incubating 7 to 10 a.m., and from 4 p.m. to 7 a.m. of next day. Male not seen.

June 15 to 22. Incubation very lax compared with first brood. On June 18, female stays out of nest during heavy cloudburst, 2 to 2:50 p.m. Male one does not approach the nest; curtsy and defense reactions die down. Male is seen daily on his avocado tree for only a few minutes during activity hours.

June 22 and 23. Female incubating very closely, absent from nest only from 8:30 to 9 a.m., and from 4 to 4:43 p.m.

June 24. Female incubating very closely, male on wire in front of nest from 8:20 to 8:25 a.m., then disappears for whole day.

June 25 and 26. Female incubating tightly, male daily on his avocado tree for only 15 minutes to half an hour, inactive.

June 30. The young is hatched, male not visible.

July 1 and 2. Very few food trips of female, mostly brooding. Male one on the avocado tree only between 8 and 9 a.m. for very short intervals, inactive; otherwise absent from territory.

July 3. Male very shy, at 8:45 a.m. on wire in front of nest, throat-sac full of insects, hovers but does not enter.

July 4. Very few feeding trips by female. 11:25 a.m., male with full throat-sac perches on wire in front of nest, hovers about 20 times, then leaves again.

July 6 and 7. For the first time, young is not brooded over night though still very small and completely naked.

July 8 to 11. Female neglects young, makes very few, short feeding trips, brood rearing instinct dies away. Starvation of young is foreseen. Male seen in territory only for a few minutes during morning activity hours; twice he hovers with bulging food sac in front of nesting hole but does not enter.

July 12. Young dies of starvation. Stomach is empty, weight: 10.1 grams. Parents not seen again, have disappeared from Rancho Grande.

Pair two. May 2. For the first time, the juveniles are taken out of the nest, weighed, measured, etc. Immediately, female two arrives with bulging throat-sac. Male two follows without food, after one minute. Both alight 5 meters away on iron girders. While female is very excited, male begins to sing repeatedly. Ten minutes later the young are restored. In order to keep nest in level position, a small supporting stone is placed in front of it. Now, from 10:50 a.m. till nearly 1 p.m., female two makes 26 vain attempts to enter the nest, hovering before the hole and flying back to the girders. Also about 20 times she retches the food out of her throat-sac and "chews" it excitedly. Finally, at 12:42 she swallows the pulp and with empty throat leaves nesting site to collect new food. She is followed by male, who was singing the whole time. The supporting stone is removed. Female arrives with bulging throat-sac, hovers, and sees that obstacle has been removed, then clings to entrance hole in a vertical, woodpecker-like position. Then enters, feeds, looks out again, feeds, and flies away to collect new food.

May 12. Fifteenth day after hatching of first young: male feeds insects to female during "social" insect catching (evening activity hours).

May 15. Eighteenth day after hatching. To understand the incidents of this day, some of the preceding events must be taken into consideration: On April 24, a two-year-old (?), light gray, bachelor male (male 2a), very easily recognized by green feathers on left chest only, in a very peculiar pattern, arrived for the first time during morning activity hours at Rancho Grande. He was driven away by adult male two. On May 5, the same young male came again at 7:30 a.m. and sat for two minutes in territory of male four. Male four was present, but being a young male himself in similar juvenal plumage, neither curtsied nor showed inclination to drive male 2a away. At 7:30 a.m., male 2a flew into territory of old male two, obviously only for the purpose of foraging, which none of the resident males ever did at that hour. Males one and two then appeared on the scene, vigorously curtsying and fencing with male 2a. Female one also appeared, with throat-sac bulging with food. Constantly curtsying and regurgitating her food, she attacked male 2a much more vigorously than male one and male two had and after a short struggle drove male 2a away. Meanwhile, males one and two were so much engaged in their curtsy ceremony that they did not realize that the intruding originator of their own excitement had already left the scene. They went on curtsying at least a hundred times before following the intruder from tree to tree. Then with female one, they drove him out of the breeding community. During the whole struggle, which was directed solely against him, young male 2a did not curtsy once. He was not observed again until May 15.

On May 15, young male 2a had tried to win female one, but was driven away by returning male one. This happened at 7:16 a.m. The sex-consciousness of male 2a was obviously aroused by female one, whose cycle had been interrupted by the death of her young with the result that, to all males, she seemed to be "free." At 10 a.m., male 2a descends precipitately from roof onto male two. Both struggling males fall to ground, form a heap of feathers, and after five minutes, old male two is defin-

itely beaten by young male 2a. Male two flees low over ground out of the territory and *is not seen again*. After his victory, male 2a remains in territory II, approaches female two, and is accepted without ceremony. Female two immediately follows male 2a from one girder to another. Then at noon, also without any apparent ceremony, male 2a begins feeding the young in nest two.

May 18. Twenty-first day after hatching, the juveniles of nest two have left the nest and are nearly ready to fledge. Female two and "foster father" male 2a are very lazy in feeding. From 7 to 9 a.m. instead of feeding the young, male 2a, sings a great deal around the nesting site and demonstrates from the roof with stalk in bill. At 10 a.m., male 2a feeds the young again, while female two sits passively nearby. Then male 2a "searches," female two joins in, and both fly hovering from hole to hole, also doing same performance before their own nest, as though no young were inside. During this searching action, female enters territory I. Immediately male one charges her and drives her back into territory II. Oscillation between brood-rearing instinct and nest-building instinct, the latter prevalent, is now obvious in "newly married" female two. Same behavior continues for the rest of the day. At 5:40 p.m., male 2a enters territory of male three, obviously for the purpose of enlarging his own small "inherited" territory, and immediately meets male three. Male 2a is driven out of territory III, begins singing in front of the old nesting site, and feeds female two with insects.

May 19. Twenty-second day, 8:30 a.m.: male 2a again tries to enter territory III and is immediately attacked by male three. After a short period of curtsying, both males take to wing and try to soar over each other's head. In mid-air they seize each other and fall down like a feather ball into a mud hole. A deadly fight goes on for 4 to 5 minutes. Both birds are completely wet, seemingly unable to fly, but they are clasped so tightly together that it is hard to follow the details. Finally, male 2a succeeds in seizing male three by the throat, pressing him down into the water. When male three seems half dead, he frees himself with a jerk and without hesitation attacks anew, clawing male 2a and pounding his opponent's head with his beak. This decides the struggle. Male 2a flees, hopping back into his territory. With effort, he reaches an iron girder where he sits for an hour drying and preening his feathers. Male three does the same on his grapefruit tree. At 10 a.m., when both seem to have sufficiently recovered, the fight continues with the same violence. Again both birds fall to the ground and again they try to strangle each other. This time male three is the agressor. After the fight, male three flees and remains unseen during the rest of the day. Male 2a remains in the territory. During the fight, no female was present. In the afternoon hours, victorious male 2a sings but also continues feeding his "step-children." At 5 p.m., both female two and male 2a independently again begin searching for new nesting sites. The female does so in spite of having her throat-sac bulging with fruit pulp for the young. Male 2a (who has no black mask) demonstrates in entrance of different holes, with stalks in his bill, but female pays no attention at all. She continues her own independent searching and finally shows great interest in a hole in which swallows (*Pygochelidon cyanoleuca*) are nesting, about three meters from her old nest. At 5:28 p.m., she enters the swallows' nesting hole for first time. Male 2a follows at 5:35, both come out at 5:39. Nest is immediately examined and one young naked swallow (2.2 grams) is found dead, still warm, with blood on his head and throat, half way between entrance and nest. As female two still has her mouth full of fruit pulp, the "murder" was probably done by male 2a. At 5:47 p.m., the swallows' nest is again visited by female two and male 2a; both sit in entrance hole. The adult swallows enter shortly afterwards and cover their remaining two young for the night.

May 20. Twenty-third day, a pair of thrushes (*Platycichla flavipes*) are beginning to build their nest in a recess in the wall, in territory II. They are neither attacked nor otherwise molested by the tersinas. With the exception of midday hours, searching goes on under the leadership of female two during the whole day. The young are rather neglected. Continuous demonstrations by male 2a are not watched by female, though they are visible to each other. Female two definitely decides on the occupied swallow nesting hole. During the afternoon, male 2a sings on the wall and iron girders near the nesting site, and he feeds female two with insects.

May 21. Twenty-fourth day, young fly out at 7:15 a.m. to the Casuarina tree. Female two feeds; male 2a defends them with curtsy movements (first time seen) against other males and other species of birds. Between 7:15 and 9 a.m., male 2a returns twice to old nesting site. At 10 a.m., he comes again with female two and a second female, which I had not seen before. While the male is again demonstrating in old nest hole, the two females curtsy energetically against each other. Meanwhile, male 2a enters again and brings out the whole old nest. With great difficulty, he flies with it in the air and after two or three meters drops it to the ground. He then descends on the fallen nest, tears some material from the inner layer and demonstrates it to his female two, who meanwhile has driven the strange female away. Instead of responding, female two enters the still-occupied swallow nest. At 10:45, both birds fly to the young in the Casuarina tree. During the rest of the day, male 2a comes six times, female only once into the territory.

May 22. Female two is not seen, the young have also disappeared from Rancho Grande, and male 2a is only seen between 8 and 9 a.m., still searching for new holes in territory II.

May 23. 8:25 a.m., male 2a again tears roots out of old nest (which was still lying on the ground), enters with them into the old nesting hole, and demonstrates in vain. Then he drops roots and flies into two other holes. Female also appears for a short time and sits passively on girders, then is not seen during the rest of the day.

May 25 and 26. Male 2a is still demonstrating during activity hours; female is absent.

May 27. 4:30 to 4:50 p.m., male 2a demonstrates, then carries long fibers of inner bark and grass into the old nesting hole and leaves them there in disorder. Later, he feeds female and sings. Female sits passively on girders.

May 28. Again no bird seen in the morning. Female two seems to have left her young. At 3 p.m., both arrive and female immediately occupies the swallow nesting hole and begins nest building (afternoon). After third construction trip with much material, she remains for 20 minutes in swallow hole. After anxious twittering, adult swallows feed their remaining two young while female two is still in the hole. A check with flashlight shows that female two had scrambled over the swallow nest. She sits close to back wall, where she has begun a new nest. She leaves at 4 p.m. Now male also enters the swallow hole. Both remain in territory till 5:35 p.m.

May 29. 8:45 to 10 a.m., female two makes two construction trips, while male 2a is demonstrating in occupied swallow nest hole, stimulating the female to build her own nest behind the swallow nest. No building activity in the afternoon. After darkness the nesting hole is checked and the two remaining young swallows are found dead between their nest and the hole entrance. Whether male 2a or female two had dragged them out of the nest and killed them cannot be ascertained. The new tersina nest is well under construction in the back of the hole. The swallow nest is now removed for better observation of the building progress on the tersina nest.

May 30. Male 2a and female two arrive at 7:05 a.m. Female observes the change and does not enter. The male, instead, enters freely and after continuous demonstra-

tion female also enters, but very reluctantly. Construction work, however, is not continued.

May 31. No construction work; instead both birds search again between 9 and 10 a.m. Neither is seen during the rest of the day.

June 1. Rain and storm: no birds seen in territory.

June 2. 6:25 a.m., both birds arrive, male feeds female. 8 to 9:30 a.m., searching activity, male 2a again concentrates on "his" old nesting hole and female seems to accept it as she enters three times.

June 3. 8 to 10 a.m., male 2a is demonstrating and female is building in old nesting hole.

June 4. 8:20 to 11 a.m., female building in her old nesting hole.

June 5. 8:15 to 10:20, birds very secretive and shy in their nest building, male 2a carrying only "show" material, singing in between trips. After nightfall, the nest, which seems nearly ready, is pulled closer for better observation.

June 6. No nest building, birds very secretive and shy, male tries to copulate.

June 7. 7:50 a.m., male 2a sings on girder in front of nest; female is squatting down inside entrance to hole. At 8:34, female leaves and immediately I see a white egg, which she laid on the bare stones, obviously not having dared to enter the nest I had moved from its original position on evening of June 5. Male enters at 8:36, takes egg in bill and tries to roll it further inside. The egg slips and male flies away; female follows. Immediate inspection shows that egg shell is cracked. Nevertheless, the egg is put into the nest. 5:20 p.m., both birds again back in territory, male sings and feeds female with insects.

June 8 to 12. During morning activity hours, male 2a still sings and searches. Female is sometimes present, but the nest is deserted and breeding "mood" of female is obviously exhausted.

June 13 to 16. Male 2a still holds territory during activity hours. No singing. Female not seen after June 12.

June 17. 7:40 a.m., male 2a seen in company of a *new, very light green female* easily recognized as not previously belonging to the Rancho Grande colony. Male searches and demonstrates, obviously tries to show "his" territory to the female, is very active, sings. But new female shows no interest and passes over into territory I. Male 2a follows and tries to feed her, whereupon female defends herself by curtsying. She apparently is not in breeding inclination.

June 18. 8:30 to 9 a.m., male 2a and new light green female again in territory, male searching, female always passive.

June 19. Rain and storm: no birds seen.

June 20. 9:15 a.m., male 2a alone, last time seen in territory.

Pair Number Three. (As mentioned before, this pair keeps closer together than any other and is more strictly limited to its territory.)

May 20. Eighteenth day after hatching of first young. Maximum feeding activity: 9 trips between 11 a.m. and 12 noon. (5 by female, 4 by male) followed by a three-hour cloudburst with no feeding trips.

May 26. All three young fly out, sit in Casuarina tree 40 meters from nesting site, but still in territory. Female three feeds, male actively defends the young. Fierce battle occurs in the air between male three and male one; the latter is driven away. Then male three attacks a *Thraupis episcopus*, chases this bird in three large circles around the territory and drives it away.

May 27. Female three and all three young have left Rancho Grande. 8 a.m., male three brings a cherry-sized fruit to his grapefruit tree and chews it for 15

minutes. Then, for first time, engages in curtsy duel with male one. At 8:45, he flies to old nesting site, alights, and sings.

May 28. Female still absent. Male three still defends his territory and every one or two hours alights for several minutes close to the old nesting hole and sings.

May 29. 4 to 5:30 p.m., both male three and his female in territory, quietly sitting side by side in their grapefruit tree.

May 30. 3 to 5:30 p.m., both male three and his female in territory; male searches with stalks in bill in grapefruit tree where female sits passively. Then, with show material flies to old nesting site, demonstrates in entrance to old nest hole, but elicits no response from female. Then male flies to neighboring hole occupied by a pair of swallows (*Pygochelidon cyanoleuca*) with three young, enters and demonstrates again while adult swallows shriek and circle around. Then three strange males arrive, and male three engages in a long curtsy battle, defending his territory.

June 1 to 10. Both birds usually absent during morning activity hours, but always present on fine afternoons from 4 to 5:30 p.m. Female three is already totally inactive, while male still searches and demonstrates without success. On rainy afternoons, only male is present, sometimes close to the old nesting hole.

June 12. Exceptionally fine sunny morning. 8 to 9 a.m., both male three and female three are in their grapefruit tree. Then male hangs head down on dead Mosonia tree, seizes a long piece of bark, lets himself fall, swings into air like a pendulum for one or two seconds and using own weight tears off a strip of bark 15 cm. long, flies with it to the old nesting hole and demonstrates first there and then in the entrance of occupied swallow nest. That evening I found one dead young swallow in hole, half way between nest and entrance.

June 12 to 18. While female remains inactive and at most appears only during sunny hours (activity hours), male three is still searching and demonstrating during fine weather. Territory is still occupied and weakly defended.

June 19. New awakening of propagation instincts, activated by arrival of new unknown pair (a young one-year-old male very active in curtsying, and a completely inactive gray-throated female). This new pair tries to install itself in territory III, on the outer sunny front of the building. The young new male is continuously searching and also singing. Male three, now very active again, attacks newcomer, drives it out of territory many times, and afterwards regularly searches, sings, and demonstrates before old nesting site. Even female three has become slightly active, and for the first time since the young have left the nest, she is seen again on girders, one meter from the entrance of the old nest.

June 20. Duelling between newcomer and male three, but with less vehemence. The newcomer yields and leaves Rancho Grande.

June 21 to July 9. Male three and female three visit their territory only every second or third day for a few minutes when weather is fine, during activity hours. No searching, no demonstrating.

July 10. Both male three and female three seen for the last time in territory. They are still "married."

Tersina viridis as Pets.—I have never had more enjoyable pets among passerine birds than my two tame male tersinas. Both were taken out of their nest shortly before fledging and soon became very tame.

Observations can be summarized as follows:

1. They do not recognize natural enemies (cats, birds of prey, etc.) but learn quickly to fear them.

2. They are instinctively afraid of rapidly falling objects.

3. They show no preference for certain colors if fruit, beads, berries, etc., of different colors are offered them for food or play.

4. They are extremely sociable between themselves, and they also actively seek the company of their masters. They follow us hopping or flying and alighting on our heads or shoulders, even when they are not hungry.

5. For passerines, they are very intelligent; they recognize their master and greet him by stretching their wings and legs. They always like to "play," parrot-like using their bills.

6. They have a preference for dark places outside their activity hours, which correspond to those in nature.

7. They fight each other with open bills, uttering nasal hissing noises and employing the same method against their master.

8. They go to sleep early and are very late risers, as in nature.

9. The first awkward curtsy movement was observed at the age of 230 days.

SUMMARY

1. In Venezuela, tersinas are migratory, wintering in the humid lowlands and breeding in forested areas at elevations of from 500 to at least 1100 meters.

2. Fighting and a display, the "curtsy," are employed in territorial activities. Song appears to play but a small part in their social life. Away from the breeding territories, tersinas are gregarious. Their food consists of fruit and insects taken on the wing.

3. Nests are built in holes in building, bridges, etc.; or the birds may excavate holes in vertical banks. Three eggs constitute the usual clutch. The incubation period varies from 13 to 17 days (mean, 15 days) and begins with the laying of the first egg.

4. The nestling period lasts for 24 days. The young are fed fruit and insects by both parents, but only the female incubates the eggs and broods the young.

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MIGRATORY BIRDS OF RELICT DISTRIBUTION: SOME INFERENCES

BY DEAN AMADON

To determine why one species, genus, or family has been replaced by another during the course of evolution is a problem at once important and difficult. The study of this question led the writer to investigate migratory birds of relict distribution. The results, though tentative, seemed so interesting that they are summarized here. The following species will serve as a basis for the later discussion.

1. Ross's Goose (*Chen rossii*).—This diminutive goose, whose total present population is thought to be less than 5,000 individuals, breeds only in a relatively small area in the Perry River district of the Canadian Arctic. In late or cold summers, as found by Peter Scott and H. C. Hanson, only a fraction of the total population may succeed in nesting, or even attempt to nest. The winter range is equally circumscribed, and comprises only the interior valleys of California.

2. Labrador Duck (*Camptorhynchus labradorius*).—This extinct species is believed to have nested on the coast of Labrador. It wintered coastally in the area from the Maritime Provinces to Chesapeake Bay. The Labrador Duck is apparently the *only* bird whose range was restricted to the American coast of the North Atlantic. The other coastal species of this area nest also in northwestern Europe, in Iceland, or in other areas. (The Ipswich Sparrow [*Passerculus princeps*] is an exception to this statement, but it is merely an insular race or representative of the widespread Savannah Sparrow [*P. sandwichensis*]).

3. Whooping Crane (*Grus americana*).—The Whooping Crane has revealed how a species, even one possessing great powers of flight and of migratory habits, may become restricted, in a comparatively short time, to very limited nesting and wintering areas. The nesting range of this crane once covered a vast area in the center of the North American continent from the far north, south to Iowa or even Louisiana. The breeding range of the few remaining pairs was for some years a mystery, despite the conspicuousness of this huge white bird, but is now believed, on the basis of one or two individuals observed in the summer of 1952, to be in the marshes adjoining Great Slave Lake. Its winter range is at present almost confined to the Aransas Wildlife Refuge on the Gulf coast of Texas. A few may winter elsewhere, as there is recent sight record of a pair in Tamaulipas, Mexico (Evenden, 1952).

The small size of both the winter and summer ranges of the Whooping Crane may, it must be admitted, be determined by its gregarious habits. We cannot safely assume that the areas where it is now found are more favorable than any existing elsewhere.

4. Bristle-thighed Curlew (*Numenius tahitiensis*).—This shorebird was discovered on Tahiti by one of Captain Cook's Expeditions. It is now known to winter on this and numerous other small islands in the mid Pacific, and nowhere else (Stickney, 1943). It was believed to be resident in Polynesia, until specimens were collected in Alaska, and it was correctly assumed that the breeding range was there. Not until a few years ago, however, was the first nest actually discovered by Allen and Kyllingstad (1949). These naturalists state that the dry upland tundra east of the Alaska coastal range, where *Numenius tahitiensis* nests, is barren and almost devoid of other breeding birds. West of the coastal range, in the low, well-watered tundra near the sea, numerous species of shorebirds and waterfowl nest in abundance. Among them are a few that might compete with the Bristle-thighed Curlew, notably the Whimbrel or Hudsonian Curlew (*Numenius phaeopus*), and perhaps in former days the Eskimo Curlew (*Numenius borealis*).

The migration of the Bristle-thighed Curlew involves a transoceanic flight, presumably non-stop, of over 2,000 miles from Alaska to the Hawaiian Islands, the nearest area where it winters. Since few are recorded in Hawaii, most of them probably fly on to islands still farther from Alaska.

There is not a single record of this curlew from Canada or the United States. This is ample proof that its remarkable migratory behavior is firmly established.

5. Slender-billed Curlew (*Numenius tenuirostris*).—This Eurasian curlew is, according to Stresemann and Grote (1943), threatened with extinction. It breeds in western Siberia and migrates far to the west to winter in the countries bordering the Mediterranean. Some individuals do, however, winter at intermediate points in Persia. Although a considerable number of Asiatic bird species migrate southwest to winter in Africa, there seem to be few, if any, others that fly west to winter in the Mediterranean area. The rather restricted breeding range is also unusual, though matched by some other Asiatic scolopacids, which, however, may, along with *tenuirostris*, all be relicts.

6. Bachman's Warbler (*Vermivora bachmani*).—This warbler nests very locally from Missouri to South Carolina but is extremely rare. Years have passed without a single one being recorded. Its ecological requirements are probably very stringent. Bachman's Warbler

winters in a restricted, insular area, Cuba and the Isle of Pines. Perhaps it was a relict species before the advent of white man—though apparently it was less rare a generation ago than at present.

7. Kirtland's Warbler (*Dendroica kirtlandii*).—The Jack Pine Warbler, as this species is also called, nests only in a few counties in central Michigan and even there is restricted to burned-over areas in which the new growth of jack pines is within certain limits of size. Thus severely limited ecologically, its population is not a large one—the total number was estimated to be less than 1,000 birds (Mayfield, 1953).

The winter range of the Kirtland's Warbler is the Bahama Islands—(map: Van Tyne, 1951). Although there is some pine country in the Bahamas, this is said *not* to be the habitat frequented by this warbler during the winter. Van Tyne and Mayfield, on a recent winter trip to the Bahamas made with the specific intent of studying Kirtland's Warbler, failed to record a single individual. This suggests that the winter habitat is not at present fully occupied. The same, however, may be true for the nesting grounds, for there are stands of pine in adjacent areas, for example in central Wisconsin, which, superficially at least, appear suitable for the species.

WHAT ARE RELICT SPECIES?

There are several types of biological "relicts," as Simpson (1944: 144–147) and others have shown. For present purposes we may regard as a relict species one whose numbers or range or both have undergone drastic reductions. With birds we usually lack fossil evidence to prove reduction of range, though the California Condor (*Gymnogyps californianus*) and a few others provide exceptions. When a species occupies a very limited area on a continent or has a very local or discontinuous distribution, we may suspect that it is a relict. This is especially true when it is well set off taxonomically and is not a geographical representative of any species. Some species of narrow geographical distribution, especially those found on islands or mountain peaks, may be just the opposite of relicts, that is, they may be of recent evolution. Such forms will not, as a rule, be limited to a small area on a continent in the absence of pronounced physical barriers.

Relict species survive in areas where competition is least severe. This may often be an island, merely because, by chance, more agressive forms did not happen to reach the island. Lemurs, for example, are still common and varied on Madagascar; elsewhere they have been largely displaced by the higher primates, which never reached Madagascar.

On continents, relicts often survive by becoming more and more specialized, through a process of natural selection, to a narrow ecological niche where they do manage to retain a competitive advantage. Hutchinson (1951) has found evidence to suggest a fugitive type of survival in certain fresh-water invertebrates. These species spread quickly into new bodies of water where they flourish, only to be displaced by species arriving later. This type of relict survival might evolve in birds. Moreau (1952) has found that certain winter migrants to Africa live in flocks which apparently travel great distances in search of areas where unusually heavy rains or other local conditions have produced a superabundance of food. The adaptation is thus analogous to that postulated by Hutchinson. Wynne-Edwards (1952) concluded that under arctic conditions adaptation may be primarily to allow a species to take advantage of temporarily favorable conditions or to recuperate from blows of the physical environment. Under such circumstances interspecific competition, even between exceedingly similar species such as the two redpolls of the genus *Acanthis*, may not, he believes, be of great importance.

The specialized niches in which relict forms survive often appear deficient or submarginal, but this is a relative matter. If the Bristle-thighed Curlew can nest successfully only on dry, barren tundra, then this habitat is, despite its shortcomings, optimum for this bird. On its winter home on Pacific atolls, the curlew supplements its diet with tern eggs, suggesting that the available food supply is not ideal for a shorebird. Again, however, the fact that it does winter successfully in Polynesia and not elsewhere is sufficient evidence that this is now the best area for it. Meinertzhagen (1928) has spoken of the fauna of the Tibetan Plateau as composed to a large extent of relict forms that have retreated to this bleak area, "whither their enemies have not been able to follow." The concept is, I believe, a valid one, but we must bear in mind that the "strategic retreat" of such forms is a long-term, involuntary, selective process. Dr. A. E. Parr has suggested to me that many deep sea fishes may be relicts of this type.

COMPARISON OF RELICT AND DOMINANT SPECIES

Relicts are species that tend to become more and more restricted both geographically and ecologically, because they are unable to compete successfully with other species. At the other extreme are those dominant or ultra-successful species that are expanding geographically and also, in many cases, in ecological tolerance. The American Robin (*Turdus migratorius*) is an example. Its breeding range is enlarging in the southeast and also in the far west. Its tendency to push into

new ecological niches is shown by the number of nests which it builds in more or less unsuitable places. At first glance it is often difficult to see why such a species is so numerous in spite of the high nesting mortality. Actually, the mere existence of numerous "submarginal" nests is an indication of aggressiveness and adaptability.

In an important paper on the ecology of Swedish birds, Svärdson (1949) showed that a species may, so to speak, behave like a relict one season and a dominant the next. When a cyclic bird is abundant it overflows from its optimum adaptive niche into all sorts of habitats in which it is not usually found and in which it is not very successful. When its population is at a low ebb, on the other hand, it is to be sought only in the most "typical" habitat. Relict forms are, from this point of view, ones that have been forced permanently into specialized little niches. Sometimes this means that they are found only in one small breeding area, as for example, the Ross's Goose. Others, like Bachman's Warbler, may occur in little pockets here and there over a wide area.

RESTRICTED WINTER RANGES OF RELICT SPECIES

Most of the species listed above have winter ranges that are as small as the nesting ranges, suggesting that they are at a competitive disadvantage at all seasons and in all places. Often, as with the Bristle-thighed Curlew, the Bachman's Warbler, and the Kirtland's Warbler, the winter range is insular. Species that winter on islands will have fewer resident species with which to compete, and these few will, on the whole, be less aggressive and competitive than ones native to continental areas. Resident insular birds live in a sequestered environment and in the course of time tend to become less adaptable than mainland species (see, for example, Bond, 1948: 221–226). The fact that some relict species reach their wintering grounds after what would seem to be unnecessarily long and hazardous migrations supports the hypothesis that insular winter ranges often do have definite advantages.

Most studies of the ecological relationships of sympatric birds give primary or exclusive attention to the breeding areas. If, however, the population of a species is drastically reduced in winter or on migration, the numbers reaching the breeding area may be so small that there is little competition for food, either intraspecific or interspecific. Even in resident species, winter rather than summer is often the crucial period, as is well known for many game species. Hence studies of interspecific competition among breeding migrant species must be analyzed with some caution (for further discussion of this and related problems see Gilbert, Reynoldson and Hobart, 1952).

Some years ago the late P. A. Taverner (1935) developed this concept on a broader basis. He pointed out that the tropical wintering area available to many species of North American migrants is much smaller than the nesting area, presumably resulting in severe competition in winter. This, he suggested, is the reason why more species of birds have become extinct in North America than in Eurasia, despite the longer history of persecution by man on the latter continent. The birds of Europe have a large wintering area available to them in Africa (Moreau, 1952), although many of them find it necessary to fly across the Sahara. Those breeding in Asia often migrate southwest into Africa too, but others winter in India, the East Indies, and even, in a few cases, in Australia.

Moreau (1952) has discussed competition between residents and migrants in winter, as did Mayr and Meise (1930) in their analysis of the theoretical aspects of avian migration.

It is possible, as Dr. E. Mayr has suggested to me, that the present reduced status of the Kirtland's Warbler and some other species with an insular wintering range is the result of an actual reduction in size of the islands on which they winter, caused by melting of the glaciers and rising sea levels. This may be a contributing factor in some cases, but the peculiar specialization that restricts the nesting habitat of this warbler to recent burns suggests that its limitations extend to the summer as well as to the winter range. Furthermore, several of the species listed above have a restricted winter range that is *not* insular.

THE "EVOLUTION" OF MIGRATION ROUTES

If, in declining or relict species, the winter range sometimes becomes, during the course of time, exclusively insular, we have a clue to the origin of certain rather baffling migrations such as that of the Bristle-thighed Curlew. This curlew is by no means the only shorebird that winters regularly in the islands of the central Pacific. The Golden Plover (*Pluvialis dominica*), the Tattler (*Heteroscelus incanus*), the Sanderling (*Crocethia alba*), and the Pacific Godwit (*Limosa lapponica*) also do. All of these, however, *except* the Curlew, also winter on the coasts of America, Asia, Australia, or Africa. It is natural to suggest that the Bristle-thighed Curlew is a relict species whose winter range *once* included such continental shores, but has *now* been restricted to the central Pacific islands, presumably because it could not compete successfully with shorebirds that winter in continental areas. As we have seen, the nature of its breeding range does make it seem likely that it is a relict species which once enjoyed a wider distribution.

In a somewhat parallel case, that of the Long-tailed Cuckoo (*Eudynamys taitensis*) which nests in New Zealand and winters on the numerous small islands of southern and central Polynesia (Bogert, 1937), there is no reason to believe that we are dealing with a relict species. It may be significant, however, that if this cuckoo were to winter in New Guinea or Australia, it might come into competition with the closely allied Koel (*Eudynamys scolopacea*), of which *taitensis* may be no more than an insular representative. Only in the Solomon Islands does *taitensis* winter in an area where *scolopacea* is resident, but the Solomons are outside the main winter range. Additional islands now submerged may have been present during the Pleistocene in the area between New Zealand and Polynesia and thus may have facilitated the evolution of this remarkable migration.

Thus, by assuming that migration routes and winter ranges may become constricted or altered by interspecific competition, we are able to explain how certain remarkable migrations to and from oceanic islands came into being. We need not fall back upon hypothetical land bridges or continental drift (Wolfson, 1948) as an explanation.

Remarks on Extinction

Examination of distributional data will often provide a clue to the extinction or near extinction of certain species. The Labrador Duck is a case in point. Bent (1925) and others have correctly stated that the presumed small size of the breeding range of this duck made it especially vulnerable to persecution. As noted above, it seems to have been the only bird whose breeding range was restricted to the American coast of the North Atlantic. This leads one to suspect that it was already a relict species at the time it came to the attention of naturalists. Persecution by man led to speedy extinction.

In the Slender-billed Curlew one finds a species whose somewhat unusual migration and small wintering and breeding ranges suggest that we are again dealing with a relict species. If this is so, we are less surprised to learn from Stresemann and Grote (1943) that it has become greatly reduced in numbers. Study of distributional data may thus indicate that certain species are in special need of protection. Investigation of "natural" relicts may show us better how to conserve species like the Whooping Crane which have been reduced to relict status by the activities of man.

Summary

When a species of bird of continental distribution is very restricted, ecologically or geographically (or both) in the absence of pronounced physical barriers, it is probably usually safe to assume that it is a

relict, that is, that the present distribution is less than it was in the past. Such relict species, when migratory, frequently have winter ranges that are as circumscribed as the breeding range itself. This suggests that the populations of such species may be, in some cases, more rigidly controlled by conditions on the wintering (or migratory) areas than by those encountered during the nesting season. This must be taken into account in assessing the importance of interspecific and intraspecific competition on the breeding grounds. Further, the winter ranges of relict species are often insular, presumably because competition is thereby reduced. Gradual restriction to an insular winter range as a species declines may, it is suggested, have produced certain remarkable migrations otherwise difficult to explain. Birds with a relict type of distribution will be especially susceptible to persecution or to man-made ecological changes and hence will require more than the ordinary degree of protection.

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OBSERVATIONS OF THE SHORT-TAILED HAWK IN FLORIDA

BY JOSEPH C. MOORE, LOUIS A. STIMSON, AND WILLIAM B. ROBERTSON

In the latest published summary of the occurrence of the Short-tailed Hawk (*Buteo brachyurus*) in the United States, Bent (1937: 254) comments: "This . . . South American hawk . . . appears in the United States only in Florida. It always has been extremely rare and local even there, and now I believe it has almost, if not quite, disappeared from that State." Because of the rarity and uncertain status of this little hawk in the United States, we have recorded our observations of it during our acquaintance with the south Florida wilderness much of which is now the Everglades National Park.

Toward the end of the summer of 1951, Moore noticed that some months had passed without an observation of a Short-tailed Hawk. Analysis of the park records suggests that this hawk may occur preponderantly in winter. Examination of the literature reveals a restriction of records to fall, winter, and spring, which appears to have escaped earlier notice. Citing 32 dated observations and collections of this hawk, Howell (1932: 180) concludes: "These dates indicate that the bird is a permanent resident of Florida." However, tabulation of the dates reveals no record for June, July, August, or September.

The number of recorded observations of this hawk nesting in Florida (Scott, 1889; Pennock, 1890; Bendire, 1892; Swann, 1922; Brandt, 1924; Sprunt, 1939; and Nicholson, 1951) certainly suggests its permanent residence in the State. However, despite this and despite the fact that naturalists afield in the summer in Florida are few, we are convinced that the concentration of records in mid-winter, shown in table 1, truly represents a greater abundance of the species present at that time. We know that in the Everglades National Park this hawk disappears in the spring from areas which had been its haunts during the winter.

Since 1932, Stimson has spent 204 days afield in the area which is now the Everglades National Park, on the Tamiami Trail west as far as Marco Island, on the South Loop Road of the Tamiami Trail, and down the Florida Keys. This resulted in 14 observations of the Short-tailed Hawk. Robertson spent six days in December of 1948, two summer months of 1950, February through August of 1951, and November, 1951, through the following July, in this same area studying the birdlife and plant communities. This resulted in five observations of the hawk. Moore, as biologist for the Everglades National Park, has been afield in the park 267 days between February, 1949, and July 1, 1952, and observed Short-tailed Hawks seven times.

TABLE 1

RECORDS OF OBSERVATIONS OF THE SHORT-TAILED HAWK BY MONTHS

	July	*Aug.*	*Sept.*	*Oct.*	*Nov.*	*Dec.*	*Jan.*	*Feb.*	*Mar.*	*Apr.*	*May*	*June*
Previously unpublished observations	0	2	4	4	8	10	20	11	6	6	0	0
Records from the literature	0	0	0	2	5	8	7	7	13	8	2	0
Totals	0	2	4	6	13	18	27	18	19	14	2	0

Dates of observations from 'Audubon Field Notes,' 1949, April, June, 1950, 1951, and 1952; Bailey, 1925; Brandt, 1924; Brewster, 1887; Broun, 1935; Cottam and Knappen, 1939; Davidson, 1951; Edmondson, 1934; Greene, 1946; Howell, 1932; Kuerzi and Lewis, 1938; Nicholson, 1951; Pennock, 1890; Reimann, 1938; Ridgway, 1881a, 1881b; Scott, 1888, 1889; Sprunt, 1939; Stimson, 1942; Swann, 1922.

Other members of the Everglades National Park staff contributed observations as follows: superintendent Daniel B. Beard (4), naturalist Willard E. Dilley (7), temporary ranger C. Tyler Hotchkiss (9), and warden M. Barnie Parker (17). Persons associated with the National Audubon Society contributed observations: Robert P. Allen (five from the field notes of Edward J. Reimann), Charles M. Brookfield (2), and Allan Cruikshank (1). Al Pflueger of Miami gave us three observations. James Jenkins of the University of Georgia faculty and J. W. Taylor of Rochester, N. Y., each contributed one while visiting the park. R. J. Longstreet of the Stetson University faculty contributed an observation from the shore of Lake Okeechobee at Clewiston. Herbert L. Stoddard, Sr., contributed an observation from north Florida. E. Morton Miller permitted one of us to examine a mounted male in the white phase in the collection of the University of Miami. We are very grateful to these persons for their help.

An observation as used in this paper means an instance in which one or more individuals were seen by one or more persons at a single time and place. We have attempted to avoid duplication of observations for the same place and day. A pair as used here means merely two birds observed by one or more persons at a single time and place.

SUMMER RECORDS

There is no mention in the literature of observations or collections of Short-tailed Hawks in Florida in the summer. In our experience they disappear almost entirely during the summer from the areas which they frequent during the rest of the year. The two following are the only summer records of which we are aware. Robertson observed a dark-phase individual soaring and calling over Key Largo on August 16, 1950, about two miles from the northeast end of the key. Beard saw a light-phase Short-tailed Hawk August 6, 1951, at 5:30 p. m. in Sandfly Pass of the Ten Thousand Islands.

Three September records shown in table 1 are from the field notes of Edward J. Reimann for 1937 in the Ten Thousand Islands where he was working as a warden for the National Audubon Society. His notes indicate that he saw Short-tailed Hawks on only three of 30 field days that month. Al Pflueger of Miami collected a bird in the light phase on September 21, 1938, near Hollywood, Florida, on the Dania Road.

COLOR PHASE

Breeding pairs of this bird have been known to consist of a light-phase female and a dark-phase male in three instances (Scott, 1889; Brandt, 1924; Howell, 1932). Dark-phase nesting females have been reported without mention of the phase of their mates, and other phase combinations of nesting pairs remain unknown. In no brood of this hawk in Florida has the color phase of the young been recorded.

The proportion of light- to dark-phase birds is a matter which may be discussed to better advantage now than has been possible before. To 15 published observations of single, light-phase birds we are able to add 30, and to 14 published observations of single, dark-phase birds we add 27. We are able to add but two observations of light-phase pairs to the one already published, but to the three published observations of dark-phase pairs, we add seven. There are five published records of pairs containing both phases. The total is 56 light-phase to 64 dark-phase Short-tailed Hawks observed or collected. In view of this, the term "normal phase" perhaps should not be used in this species.

Literature records of color phase are from 'Audubon Field Notes,' 1949, April, June, 1950, 1951 (a black phase pair observed by Stimson was included in the "six" enigmatically reported), 1952; Bailey, 1925; Brandt, 1924; Brewster, 1887; Broun, 1935; Davidson, 1951; Edmondson, 1934; Greene, 1946; Howell, 1932; Kuerzi and Lewis, 1938; Nicholson, 1951; Reimann, 1938; Ridgway, 1881a; Scott, 1888, 1889; Sprunt, 1939; Stimson, 1942.

OBSERVATIONS

Sight records of this little hawk above Paradise Key and Taylor Slough in the Everglades National Park during the winter of 1951–52 are interesting in themselves. Lone, light-phase individuals were seen here November 20, December 14, 29, January 28, 29, February 7, 13, and March 18. Lone, dark-phase individuals were observed January 10, 15, 17, 24, 31, and February 17. These records are available largely through C. Tyler Hotchkiss, who made and recorded eight of

them while assigned to duty at Paradise Key. These were all records of birds on the wing. Dilley says they were most often seen hanging or circling in the up-draft at the eastern edge of Paradise Key where the wind coming across the open sawgrass glades and Taylor Slough encounters the wall of hammock trees.

Among the Short-tailed Hawk observations recorded in Parker's patrol log there are two local series. During the winter of 1950–51 while patrolling by boat, he recorded seeing a light-phase Short-tailed Hawk in the headwaters of Lostmans River in the Everglades National Park: November 23, 29, and December 14 over Big Lostmans Bay (lat. 25° 33′ and long. 81° 06′) and April 5 over Puzzle Lake (lat. 25° 35′, long. 81° 06′). On December 14 he also recorded a dark-phase individual near Tigertail Camp which he locates about four airline miles east of Puzzle Lake. During the winter of 1951–52 in the Lostmans River system, Parker recorded lone, light-phase Short-tailed Hawks in the "headwaters" January 1, over Second Bay February 14, and over Puzzle Lake April 17. During this period he also recorded dark-phase individuals over Second Bay: February 28, March 17 and 18.

We can present five observations for the West Lake-Snake Bight-Coot Bay area for the winter of 1950–51, and three more for that of 1951–52. These were all dark-phase birds. The first winter, near Gibby Point on Snake Bight, December 23 (a pair); north shore of West Lake, January 16; near Coot Bay Pond, January 18 (a pair); same place, February 8; mid-length of Snake Bight Road, April 8. The following winter: over Coot Bay, November 17 (a pair); Flamingo Road near Bear Lake Road junction, November 22; same place, December 18. Most of these observations were by the authors.

Short-tailed Hawks have been recorded from northern Florida (Pennock, 1890; Edmondson, 1934; Ridgway, 1881b; Brandt, 1924), but they have been rare. Therefore we transmit the following observation by Herbert L. Stoddard, Sr., which he provided us in a letter of April 14, 1952. "Leon Neel, my forestry assistant . . . and I saw one that we flushed out of a cypress right over our heads on the north end of Dead Lakes, Calhoun County, Florida, on April 20, 1951. The bird was only about 20 feet distant and was in the light phase. A half hour later and about one eighth of a mile distant we saw the same bird or another in the same phase circling overhead, where the glasses brought out the markings (narrow tail-bands, etc.) to perfect advantage. We revisited this area only once during the breeding season, when we did not see the hawks."

FIELD MARKS AND BEHAVIOR

It may be of value to persons watching for this rare hawk in the field if the authors record here such of its markings and behavior as have been observed and recorded in field notes at the time. In the pinewoods some two miles northwest of Paradise Key on December 13, 1951, Robertson observed a pair of light-phase Short-tailed Hawks as they flew 30 to 40 feet above ground and recorded: "They appeared in flight to be fully as large as the Red-shouldered Hawks of this area . . . . The tails appear dusky (underneath), not at all or only very indistinctly banded; wing linings were not as light or showy [as Peterson's figure, 1947, opposite p. 59] but the contrast between the black primaries and the rest of the underwing was noticeable. The breast and belly were white and without marking. Contrast between dark head and white of throat was especially noted." We had discussed this observation before Moore encountered a light-phase bird in the pine woods about four miles east of that locality, and recorded: "It was soaring or gliding into the wind and barely moving about 50 feet above me. Watched it with my glasses for 15 to 20 seconds before it moved off. Underside of tail light as belly and without bands. Well marked with blackish on top of head." Fifteen days later Robertson saw a light-phase Short-tailed Hawk in the pine woods about three miles west of where he had seen the light pair. He noted: ". . . in flight and perched in open . . . . A good look; the bird was studied for about ten minutes before it flew. Contrast between the black cap and white throat is a good field mark for white-phase birds." These three observations may all have been of the two birds originally observed by Robertson and may possibly have been of birds not fully adult.

Of dark-phase birds Moore made the following note in the field immediately after watching one from his boat at a distance of 35 or 40 feet as it perched calmly on a buttonwood tree on the north shore of West Lake, January 16, 1951: "It did not appear to be a young bird. It was dull black all over except for some yellow on the base of the beak, and yellow legs. Not shiny black like a crow. The underside of the tail was pale gray with one dark bar near the distal end. We flushed it on purpose, but it ducked over the mangroves giving only a fleeting glimpse of some light area on the under side of the wings . . . ." These notes were made before consulting Peterson's (*op. cit.*, opp. p. 58) figure, and they do disagree with his drawing of the tail.

We have observed this hawk hang in the air as if suspended by an unseen wire on two occasions at places where conditions were right for a steady up-draft. We have already mentioned Dilley's comment on

their frequent use of an up-draft at Paradise Key. Another flight maneuver is recorded for this bird by Howell (1932: 181): "Once he left his perch to make a few circles in the air, then set his wings close to his body and shot down like a rocket at an angle of 45 degrees toward the swamp, screaming as he went." Dilley recorded the following note for Paradise Key on November 20, 1951: "A light-phase [bird] soared around at an elevation of a hundred feet, and after a few minutes closed its wings and dropped down into the trees and was lost to view."

On October 7, 1949, at Paradise Key Dilley observed a Red-shouldered Hawk (*Buteo lineatus*) harry a Short-tailed Hawk. He wrote: "One dark bird noted on Paradise Key. A Florida Red-shouldered Hawk drove it from its perch and pursued it for several minutes."

Al Pflueger of Miami told Moore that the light-phase male which he collected near Hollywood was eating a Redwing (*Agelaius phoeniceus*) in the middle of the road; the Redwing was possibly a highway casualty.

HABITAT

The Short-tailed Hawk has been seen most often in Florida in or near swamp forests. Virtually all of the published observations of this bird which mention its environs indicate that it was seen in or above mangrove or cypress swamps. At least seven of the twelve nests of this hawk which are described in the literature were built in cypress swamps. Two were in mangroves. Of 39 literature records of this hawk which indicate the habitat, 11 are in the general mangrove area and 13 are for cypress swamp. Our observations have been made during field work which has rarely taken us to real cypress swamps, and this surely does bias our data in favor of the mangroves. It should be noted that our only recorded occurrences of the Short-tailed Hawk out in the Everglades proper (*i. e.* well away from the Big

TABLE 2

PLANT COMMUNITIES OVER OR IN WHICH SHORT-TAILED HAWKS WERE OBSERVED

Plant community	*Unpublished observations*
Mangrove (not including below)	29
a. salt prairie, hammock, etc., within the general mangrove area (including the Keys and the Cape Sable area)	10
b. transition between mangrove and glades	4
Glades	2
Pineland (including hammocks and finger glades)	20
Cypress	1

Literature sources of habitat data used are 'Audubon Field Notes,' 1949, April, June, 1950, 1951, 1952; Brandt, 1924; Howell, 1932; Nicholson, 1951; Sprunt, 1939; Stimson, 1942; Swann, 1922.

Cypress, the pinelands, and the mangroves) are two observations by Stimson, both 30 miles west of Miami on the Tamiami Trial (U. S. Highway 41): one dark-phase bird on March 29, 1932, and a dark-phase pair April 6, 1944 (see table 2).

ABUNDANCE

There seems to be some indication that Short-tailed Hawks have been more numerous in south Florida during the last several years than in the preceding decade or two. When the observations of this hawk recorded by Stimson during the past 20 years are related in

TABLE 3

RELATION OF NUMBER OF DAYS BIRDING IN THE WILDERNESS AREAS OF SOUTHERN FLORIDA (AREA OF THE PRESENT EVERGLADES NATIONAL PARK, FLORIDA KEYS, TAMIAMI TRAIL, LOOP ROAD, AND MARCO ISLAND) TO NUMBER OF OBSERVATIONS OF THE SHORT-TAILED HAWK BY LOUIS A. STIMSON

Periods	*Field days*	*Observations*	*Observations per 100 days*
1932 through 1936	35	1	2.8
1937 through 1941	69	3	4.3
1942 through 1946	41	3	7.3
1947 through 1951	69	7	10.1

five year periods to number of bird-watching days in the south Florida wilderness, the result is not easily explained otherwise (see table 3). Since Stimson observed only one hawk after we began assembling data for this report, no bias of his data may be attributed to this. No two of the seven observations in the last period of table 2 were closer together than 26 days. Some of the observations were possibly of the same individual birds (*e. g.* a dark-phase pair Dec. 23, 1950, at Gibby Point and Jan. 18, 1951 near Coot Bay Pond). Visits to this Cape Sable area were more frequent during this last period. Observations of Short-tailed Hawks in the area between the Paradise Key and Cape Sable, tabulated against birding trips to the Cape Sable area show a result similar to that of table 3, but the data are, of course, fewer and the value less clear. One might conjecture that the protection which this hawk has received from casual shooting since the establishment of the Everglades National Park in 1947 has permitted its numbers to increase.

SUMMARY

Short-tailed Hawks may be seen with some regularity in certain wilderness areas of south Florida in winter and early spring. The first two observations of this hawk in Florida in summer are presented. Despite this and the fact that the species does nest in Florida, strong

doubt is cast upon the assumption that the population of Short-tailed Hawks present in Florida during winter remains during summer. Light- and dark-phase birds have been observed with approximately equal frequency. Association of dark-phase birds in pairs seems most frequent, mixed pairs less frequent, and light-phase birds in pairs the least frequent. Pairs which include both phases are the only ones recorded nesting. Afield the bands on the underside of the tail may appear to be entirely absent in light-phase birds. These may also be very obscure on some dark-phase birds, at least while the bird is perched. The contrast of the blackish head and cheeks with the white throat is deemed a good field mark for light-phase birds. Records indicate that this hawk is most often seen in cypress swamp forests and mangrove swamps. Its numbers in south Florida appear to have increased during the past five years.

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Everglades National Park, Homestead, Florida, November 3, 1952.

SECOND BROODS IN THE EUROPEAN STARLING IN NORTH AMERICA

BY BRINA KESSEL

For years ornithologists have debated whether the European Starling (*Sturnus vulgaris*) raises one or two broods during a breeding season. European observers have recorded a few instances in which marked individuals are definitely known to have raised two broods in one season—Berndt (1939) in Helgoland; Creutz (1939), Freitag (1936, 1937, 1939), and Sunkel (1931) in Germany; Kluijver (1933, 1935) in Holland; and Jourdain (1913) and Ticehurst (1913) in the British Isles; but a review of the literature reveals only one such instance reported in North America, by Brackbill (1949) in Maryland.

Intensive observations of the starling during five breeding seasons (1947–1951) at Ithaca, New York, however, clearly indicate that many starlings in this region regularly raise two broods in a season. Song and courtship activities are renewed about the nest sites almost immediately after the young of the first brood have fledged. Many of the same nesting sites are used twice in one season. And the simultaneous egg-laying by a large number of starlings in mid-June, about a week after the first brood has fledged, resembles the simultaneous layings of the beginning of the first brood, and not the scattered layings of intermediate nestings.

The ultimate proof of second broods comes from marked birds that have been observed to raise and fledge two broods in a season. Over 193 females were banded in nesting boxes at Ithaca from January through July, 1947–1951; 40 of these were definitely found to have undertaken the raising of second broods after the successful completion of a first. Ten of these females raised two broods in each of two consecutive years; one raised two broods in each of the breeding seasons of 1948, 1949, and 1951. There were undoubtedly more instances of second broods, and of second broods in consecutive years, but because it was not possible to capture all the nesting females on the study area during both nesting periods each year, complete statistics are not available.

Although no reference to second broods by first-year females has been found in the literature on the starling, several such instances were observed at Ithaca in 1950 and 1951. Two first-year females, banded as nestlings in 1949, both successfully fledged a first brood in 1950, and each undertook to raise a second brood. Unfortunately neither second brood was fledged; one female deserted the nest when the young were three days old; the other was killed by a Cooper's

Hawk when the young were thirteen days old. Three other first-year birds, which were not banded as nestlings, but were aged by hackle feathers (*cf.* Kessel, 1951) and banded during the first nesting period, were known to begin second broods. The eggs resulting from two of these second nestings were deserted before hatching, and the young of the third died before leaving the nest.

Second broods apparently occur throughout the breeding range of the starling in eastern North America, with the exception of the extreme northern part. (The breeding biology of the starling has received little study west of 95° W. Long.; hence no statement can be made on second broods from this region.) An analysis of the egg-laying dates available in the literature, and of those found in the Bird Distribution File of the Fish and Wildlife Service, shows conclusively that throughout eastern United States, north of 30° N. Lat. (the southern limit of the breeding range), breeding occurs over a long enough season to include second broods. It also shows that the majority of egg-laying dates at each latitude falls into two definite periods, the pattern of these periods corresponding with the periods of the first and second broods at Ithaca, and with those proved by Brackbill (1949) in Maryland.

Egg-laying follows a seasonal clinal pattern, being about thirty days later for each 10° of latitude northward. Egg-laying for first broods begins as early as March 15 in the south (30° 30′ N. Lat.), but not until June 15 in the extreme north (50° 12′ N. Lat.). The egg-laying for second broods follows about forty-five days after that of the first brood. McMillan, Michigan (46° 20′ N. Lat.) is the northernmost area where available data definitely indicate the occurrence of second broods. Here the young of the first brood left the nest June 11, 1935; and on August 1 of that year more young were found in the nest (Fish & Wldf. Serv. Bird Dist. File). At Kamouraska, Quebec (47° 35′) young were found in the nest on July 16, 1927. These were probably second-brood young, too, but because the dates of the first brood of that year are not known, one can not be sure (Fish & Wldf. Serv., *ibid.*). No evidence of second broods has been found north of 48° N. Lat., east of 95° W. Long. in North America. North of 48° N. Lat. egg-laying for the first brood does not begin until May 15 or later, and either the short season or the physiological condition of the bird this late in the season apparently precludes second broods this far north.

There is some evidence that the frequency of second broods may vary with several factors. As noted above, geographic distribution may determine the presence or absence of two broods. Even within

the normal range of second broods, geographic locality probably affects the number of second broods, though the North American data are too sparse to prove this. The earliness of the season may affect the number of broods. Creutz (1939), Berndt (1939), and Kluijver (1933) found that second broods varied from 35 per cent of the first brood to zero per cent, with the greater percentage of second broods occurring in the years when the season was early, enabling first broods to get underway early. Berndt (*op. cit.*) indicates that moisture, too, may be an important factor in the occurrence of second broods. He records that the year 1934 had an early season with the usual number of first brood layings, but that the season was unusually dry and no second broods were observed.

Effects of the earliness or dryness of the season on the number of second broods are not evident from the studies at Ithaca. In the few years for which full data are available (1948, 1950, and 1951) the dates of the first eggs of the first brood were April 20, April 29, and April 27, respectively; these dates show no significant correlation with the number of second broods. (In 1951 all the nestlings were collected before they left the nest. Because the nestlings were taken close to the end of the nestling period, and the sexual cycle was apparently not seriously interrupted, the 1951 data are incorporated in these analyses.) There were no abnormally dry periods during the study, monthly rainfall of all three seasons varying from 1.69 to 4.18 inches (except June, 1951, when it was 6.11 inches); hence no comparative data are available.

Most of the female starlings in the vicinity of Ithaca that are physiologically capable of undertaking a second brood apparently do so. It was noted during the present study that any birds that have their first nesting attempt of the season broken up apparently can not fledge their re-nest brood in time to lay eggs for the regular second brood while it is physiologically possible. Two successful broods, therefore, are to be expected only from those females whose first brood was raised successfully and without interruption. It is of interest, then, that in Ithaca, when the three complete years are taken as a unit, over 93 per cent of the first broods that were begun with the early layings and were successfully completed, were followed by second broods. (For this percentage, each year's total data were used, rather than just the few data available from marked birds; that is, all the layings that occurred during the simultaneous layings for second broods, and that occurred at the time the banded females were laying for second broods, also were assumed to be second broods. In view of studies of the sexual cycle of the starling, this assumption

appears to be safe.) In 1948, 65 first brood nests were begun, but because of desertions and deaths (caused almost entirely by human disturbances), the young of only 43 of these early nests were fledged. Forty-one second broods were begun that year. In 1950, 57 first broods were begun, but for the reasons mentioned above, only 39 were fledged. Thirty-nine second broods were begun in 1950. In 1951, 61 first broods were begun, and 47 were fledged; 41 second broods were begun.

No proof of three successive broods has ever been established, nor is there any evidence in the tempo of the reproductive cycle to indicate the occurrence of third broods. Apparently the casual references to three broods that one finds in the literature are the result merely of a few observations of starlings nesting at abnormal times of the year, for the starling has been recorded nesting in every month of the year by one observer or another. In view of the precision and relative shortness of the starling's normal breeding season, these abnormal nestings are not easy to explain (*cf.* Bullough, 1942). Whatever the reason, however, the occurrences of autumn and winter breeding are rare, and, in light of our present knowledge, they should not be considered third broods.

SUMMARY

Intensive observations of the starling during the breeding seasons of 1947 through 1951 at Ithaca, New York, have resulted in data that now prove that many starlings regularly raise two broods in a season. These data, along with the records of other observers, indicate that in eastern North America, between northern Florida and the Great Lakes, many starlings raise two broods in a season.

In Ithaca most of the female starlings that are physiologically capable of undertaking second broods do so; and in 1950 and 1951 several instances were noted in which even first-year females attempted second broods. Because of relatively uniform seasons during the study, the effects of the earliness or dryness of the season on the frequency of second broods were not apparent. No evidence of third broods was detected; apparently the casual reference to third broods are the result of a few observations of starlings nesting at abnormal times of the year.

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University of Alaska, College, Alaska, January 22, 1953.

A FOSSIL HOATZIN FROM THE MIOCENE OF COLOMBIA

BY ALDEN H. MILLER

THE rich collections of Miocene vertebrate fossils obtained by Dr. R. A. Stirton and his associates in the upper Magdalena Valley of Colombia, South America, have consisted chiefly of mammalian and reptilian material (Stirton, 1951; Savage, 1951). Even though a bat and small primates have been found, bird remains inexplicably are almost lacking. However, in close association with the monkey, *Cebupitheca sarmientoi*, was part of a skull which when prepared proved to be that of a galliform bird. Further removal of the matrix uncovered many of the fine details of cranial structure which showed that this fossil bird had close affinity with the aberrant galliform type known as the hoatzin, family Opisthocomidae. This family heretofore has been unrepresented in the fossil record.

Few groups of birds have the narrow, elongate postorbital cranium lacking high occipital crests which is found in the Galliformes. Some genera of the Tinamiformes have the same general configuration of the cranium, but in all the tinamous examined the suprameatic crest is very differently shaped from that in the Galliformes; it consists of a simple arc bearing a down-turned process anteriorly. Also the occipital condyle is a simple, single knob in the Tinamiformes instead of a dorsally cleft process as in the Galliformes.

The Miocene fossil shows so many points of similarity to the hoatzin, even in matters of precise location and size of foramina in the orbit, that I have no hesitancy in placing it in the family Opisthocomidae. It may be described as

Hoazinoides magdalenae, new genus and species

Type.—Partial skull, complete dorsally from midfrontal level to foramen magnum; temporal area and most of suprameatic border complete on left side; left posterior face of orbit represented, although fractured dorsally; basioccipital, exoccipital, and opisthotic well represented on right side; no. 42823, Univ. Calif. Mus. Paleo.; figs. 1 and 2.

Type locality.—"Approximately 8 meters of gray clays overlying concretionary sandstone which rests on the conglomerates so conspicuously exposed in the middle of the Villavieja-Cerro Gordo section . . . . Found in the clays adjacent to the Villavieja-San Alfonso trail, several meters beyond the house called La Venta, Huila, Colombia" (Stirton, 1951). Locality V 4517; Royo no. 1999. Late Miocene age. La Venta fauna.

Diagnosis.—Similar in size and configuration to *Opisthocomus hoazin* but parietal area of skull concave in lateral profile rather than rounded; frontal area less rounded in lateral profile and lacking median groove; distance from transverse occipital crest to upper border of foramen magnum slightly greater; median occipital ridge sharper

and more elevated; scar of *M. pseudotemporalis superficialis* on orbital surface less extensive dorsomedially; notches on anteroventral surface of suprameatic crest less well defined.

Measurements.—Hoazinoides: greatest width of frontals at anterodorsal base of postorbital process, 23.2 mm.; least width across skull at level of temporal fossae, 18.8. *Opisthocomus*, 3 skulls: width at frontals, 21.0, 21.3, 21.4; width at temporal fossae, 19.1, 19.4, 19.6.

TABLE 1

DIFFERENCES BETWEEN CRANIA OF THE OPISTHOCOMIDAE AND THE CRACIDAE (*Ortalis*)

Opisthocomus	*Ortalis*
Upper orbital fenestra: small, rounded	Large, extended anteriorly above septum
Supraorbital plate: laterally well produced at level of anterior brain surface	Less extended laterally
Scar of origin of *M. pseudotemporalis superficialis* inside orbit: large, well defined, extending close to borders of both orbital fenestrae	Margins not defined, attachments weak, area apparently smaller
Scar of origin of *M. adductor mandibulae externus superficialis:* large, well defined, extending close behind rim of postorbital process	Not well defined posteriorly, less extensive anteriorly, scar of a deeper layer visible within temporal notch
Axis of temporal notch or groove between postorbital process and suprameatic crest: horizontal (in line with palate)	Approaching vertical, about 60° from horizontal
Suprameatic crest: produced ventrolaterally with long anterior process	Closely pressed to cranium; anterior angle not produced
Supraoccipital ridge: close to foramen magnum	Well separated from foramen magnum
Basitemporal plate: two mounds on either side of mid-line	Smooth, evenly rounded surface
Lateral process of basitemporal plate (exoccipital, opisthotic): produced ventrolaterally	On approximately same level as main surface of plate

The opisthocomids differ from the cracids, which are a representative and apparently primitive group in the typical galliform line, in the points listed in table 1 as concerns the parts of the skull preserved in *Hoazinoides*. In general the skull of the modern hoatzin is shorter, the brain case is more rounded dorsoposteriorly, and the bill is shorter and more massive than are these parts in the cracids; concomitantly differences occur in the attachments and size of the adductor muscles of the jaw. The important differences in the angulation of the temporal notch, which in the Opisthcomidae has a nearly horizontal axis, and in the depth of the notch medial to and above the suprameatic

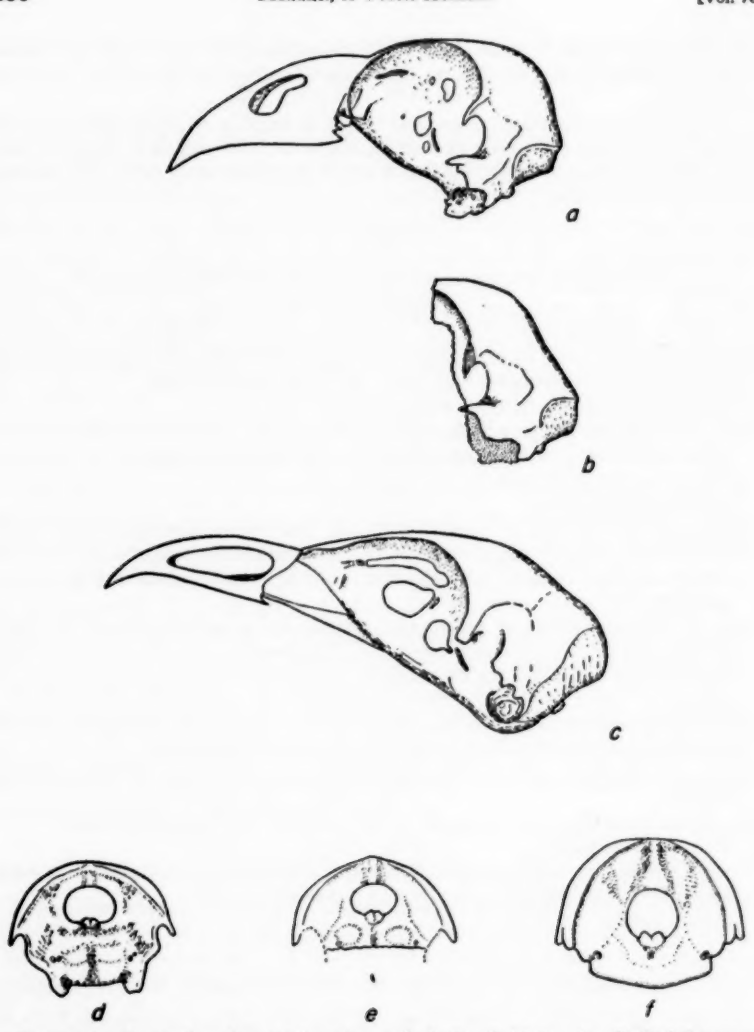

FIGURE 1. Lateral and posterior views of skull, all × 1. (*a, d*) *Opisthocomus hoazin*, no. 52886 Mus. Vert. Zool. (*b. e*), *Hoazinoides magdalenae*, type; stippled areas and margins consisting of broken lines indicate reconstructed areas; in bilaterally symmetrical drawings missing parts on one side are drawn as mirror images of other side without indication of reconstruction. (*c, f*) *Ortalis wagleri*, no. 78691 Mus. Vert. Zool.

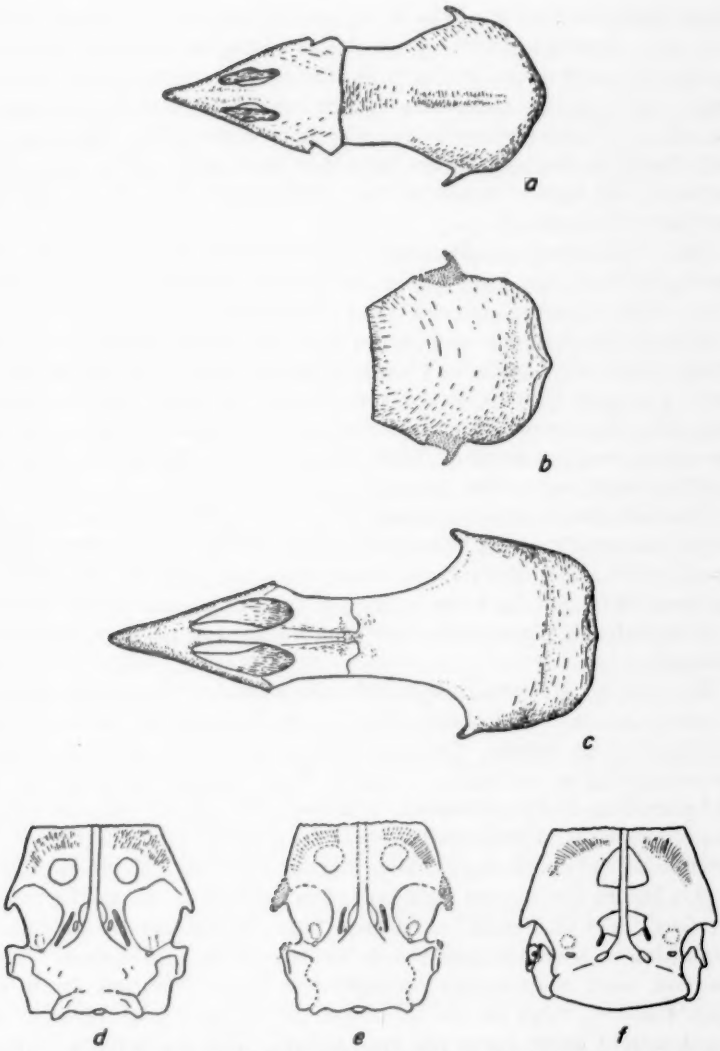

FIGURE 2. Dorsal views of skulls and anterior views of orbit and base of cranium (semidiagrammatic), all × 1. (*a, d*) *Opisthocomus hoazin*. (*b, e*) *Hoazinoides magdalenae*. (*c, f*) *Ortalis wagleri*. Same specimens as in figure 1.

crest reflect much of the type of bill and its angulation and leverage The close correspondence of the fossil with *Opisthocomus* in these significant particulars strongly indicates that *Hoazinoides* had a similar bill and jaw apparatus. Moreover, in the details of location and shape of the foramen for the trigeminal nerve and of the foramen and groove for the ophthalmic branch of this nerve and in the sculpturing of the under surface of the orbital roof, *Hoazinoides* closely matches *Opisthocomus*.

The most significant departure of *Hoazinoides* from *Opisthocomus* consists of its flatter, less rounded brain case, especially in the parietal area. This Miocene representative had not attained the degree of doming of the cranium, and perhaps not the general skull shortening which seems to go with this feature, that is seen in the living bird. In this respect *Hoazinoides* is very similar to other galliforms and especially the cracids of similar size such as *Ortalis wagleri; Crax* on the other hand has attained, independently of the development in the opisthocomids, an arched parietal area.

Does this similarity in the parietal area actually serve to bring the cracid and opisthocomid lines closer together than they formerly were considered to be? Probably it should be so interpreted, but there is the possibility that the lesser arching of the cranial roof of *Hoazinoides* is independently developed apart from a cracid or common galliform ancestry.

The scar for *M. pseudotemporalis superficialis* on the orbital surface is less extensive in *Hoazinoides* than in *Opisthocomus*, but its rim is not visible at all in *Ortalis*. Probably this feature of *Hoazinoides* should be interpreted as indicating a slightly lesser specialization of the bill and jaws than in *Opisthocomus*. This condition along with the lesser doming of the skull leads me to regard *Hoazinoides* as a more primitive member of the opisthocomid line, thereby marking a closer approach of this line to the general galliform stock, possibly even to the cracid division. Yet it should be realized that *Hoazinoides* by no means establishes a phyletic junction point with other galliforms. Such junction must considerably antedate the Upper Miocene, for in its main features, even in the Miocene, *Hoazinoides* had become an opisthocomid as we know the type today. The less advanced morphological modifications of *Hoazinoides*, however, do lend support to the inclusion of the Opisthcomidae in the Galliformes, an inclusion which has variously been doubted in the past (Parker, 1891; Banzhaf, 1929; Stresemann, 1934).

The single living species of hoatzin inhabits river-border woods of the low-lying drainage basins of the Amazon and Orinoco rivers in

South America. It is not known to occur west of the Andes in the Magdalena River drainage where the Miocene fossil was found. If the Miocene bird favored similar woods and border brush above damp ground or water, it would be expected to occur in an area such as that represented by the La Venta deposits. Here existed a low-lying river flood plain with a rich crocodilian and aquatic chelonian fauna (Savage, 1951) and a considerable woodland as indicated by the presence and close association of primate fossils (Stirton, 1951).

The modern hoatzin is a bird that clambers about in dense vegetation and flies weakly. Both adults and young not infrequently fall into or take to the water. The young are renowned for their possession of well developed claws on the first two digits of the wing which they use extensively in climbing, and the adults, although lacking claws, use the whole wing as an aid in climbing (Beebe, 1917). The primitive aspect of the wing of the young, although it has been made much of as a possible stage, or at least a copy of a stage, in the evolution of the wing of birds (Parker, 1891; Beebe, 1917; Heilmann, 1927), is generally regarded now as a secondary adaptation of the young for climbing in the preflight stage (Steiner, 1918; Stresemann, 1934).

Grateful acknowledgment is made to Dr. R. A. Stirton for the opportunity to study this fossil and to the Servicio Geológico Nacional de Colombia and the Associates in Tropical Biogeography of the University of California for support of the work of Dr. Stirton and myself in Colombia.

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Museum of Vertebrate Zoology, Berkeley, California, January 28, 1953.

GENERAL NOTES

Mallard Nesting in Maine.—The Common Mallard (*Anas platyrhynchos platyrhynchos* Linnaeus) has been suspected of breeding occasionally in Maine, although no actual instance of nesting has been recorded (Palmer, Maine Birds, 1949, Bull. Mus. Comp. Zoo., Harvard College, Vol. 102, p. 75). While far from being abundant, this species has been observed during recent years at all seasons, but particularly during the fall migration. The discovery of two nests, one each in 1949 and 1950, at the Davis-Holbrook Marshes in Eddington, Penobscot County, Maine, and one flightless brood at Passadumkeag, Penobscot County during 1952, are of interest.

On May 8, 1949, I observed a drake mallard in the water along the edge of a small marshy cove. He flushed and flew to a distant part of the area. Within an hour I flushed a hen mallard from a nest that was within 450 feet of the area where the drake was first seen. The hen left the vicinity by the same route taken by the drake. Later in the day the pair was flushed from another marshy portion of the area and after circling for several minutes they alighted in the open lake about one-half mile distant.

The nest contained five light greenish-buff eggs. During the second check, on May 18, the hen was flushed from the nest at 11:00 a.m. Nine eggs and an increased amount of down were present. On May 29, the writer, together with Howard L. Mendall, again checked this nest and flushed the hen at 3:40 p.m. When re-examined on June 21, the remaining evidence indicated a successful hatch.

The nest site was much like that of a Black Duck (*A. rubripes*). It consisted of a small hummock formed by stems of holly (*Ilex verticillata*), sedge (principally *Carex lasiocarpa* var *americana*), and leatherleaf (*Chamaedaphne calyculata*). The general area is characterized by floating sedge meadow with scattered patches of woody plants.

The nest was constructed of the stems and leaves of sedge and a few dead leaves of leatherleaf. It was approximately 15 inches above the water, 125 feet from upland woods, and 240 feet from the channel of open water.

The second nest, found on May 9, 1950, was at a similar site, and was within 100 feet of the first. This nest contained 8 eggs when discovered. Another egg was subsequently laid, and when re-checked on June 4, nine newly hatched ducklings were present.

Attempts to locate the broods after they left the nest were unsuccessful. In June 1949, a hen mallard was flushed from dense cover. Her behavior was like that of a broody Black Duck, but no ducklings were seen.

On July 17, 1952, a hen mallard with a brood of 12 half-grown, flightless young was observed from a canoe on the Penobscot River at Passadumkeag, Penobscot County, Maine. These birds were watched for several minutes with the aid of binoculars at a distance of about 300 feet. Eventually the hen and brood scurried to shore into dense growths of ferns and grasses.

This is a contribution from the Maine Cooperative Wildlife Research Unit, Orono, Maine; Maine Department of Inland Fisheries and Game, University of Maine, Wildlife Management Institute, and U. S. Fish and Wildlife Service, cooperating.—
MALCOLM W. COULTER, *Assistant Leader, Maine Cooperative Wildlife Research Unit, Orono, Maine.*

Further Information on the Turkey Vulture (*Cat hartes aura*) in New England and Eastern Canada.—A paper by the undersigned, "The Turkey Vulture in New England and Eastern Canada up to 1950" (Auk, 68: 315–333, 1951), has elicited certain material which seems worthy of record.

Maurice Broun (1951: *in litt.*) wrote that Judith Gregory, of Charlottesville, Virginia, saw an adult Turkey Vulture "about 8 miles south of Inverness, Cape Breton, Nova Scotia, on the coast," during the first week in August, 1948.

Christopher M. Packard (1951: *in litt.*) reported his unpublished observation of a Turkey Vulture soaring "very low over a burnt-over section just outside of Brunswick, Maine," in early May, 1944.

A note by Vera H. Wallace (New Hampshire Bird News, 4: 32, October, 1951), discussed records for this species in the vicinity of New Hampton, N. H. Mrs. Wallace (1951: *in litt.*) informed us that this note erroneously gives "April 12, 1947" as the date on which a bird was taken near New Hampton; the correct date is April 13, 1947, as given in our paper. However, Mrs. Wallace's note added a New Hampshire sight-record which we had overlooked: a bird seen by her on July 21, 1947, in New Hampton. Hugh Williams, of Waldoboro, Maine (1951: *in litt.*), described accurately to us six Turkey Vultures which he saw over Dublin, N. H., in May, 1941.

In view of the scarcity of records for this species in Vermont, the report by Thomas H. Foster (1951: *in litt.*) of a bird, which he saw over his home in Bennington, Vermont, April 12, 1951, deserves mention.

George Decker (1951: *in litt.*) wrote that he had found a Turkey Vulture roost in a wooded swamp in central Dutchess County, N. Y., and another roost close to the New York stateline in Litchfield County, Connecticut. According to Decker, the latter roost is located on a rocky hillside; it is used in summer by about 40 birds and has existed for several years. Mr. Decker added that, at the time of heavy snows prevailing during the winter of 1947–48, "dogs killed several deer on Preston Mountain, and the vultures (about 30) wintered, feeding on the dead deer." Preston Mountain is near Kent, Conn.

Our first report of a Turkey Vulture feeding on an animal killed on a New England highway came to us from Henry H. Townshend (1951: *in litt.*), who wrote that in April, 1951, for the first time in his experience, he closely observed one of these birds feeding on a dead skunk on a highway near Salem, Conn.

Samuel A. Eliot, Jr. (1951: *in litt.*) pointed out that an immature Turkey Vulture was caught alive in Longmeadow, Massachusetts, in late November, 1946, and was kept for some time in the Forest Park Zoo, Springfield, Mass.

A paper by Dr. A. E. Allin (Can. Field-Nat., 58: 185) should be called to the attention of students of the northern limit of range of *Cathartes aura*. Dr. Allin (1951: *in litt.*) suggested that the birds discussed in his paper probably are referable to the western race, *teter*.

The senior author regrets that, through his inadvertence in proofreading, the name of Dr. Edson B. Heck appeared as "Gordon Heck" (Auk, 68: 319), and apologizes for this error.

We are grateful to the various correspondents who supplied the material contained in this note.—AARON M. BAGG, *72 Fairfield Ave., Holyoke, Mass., and* HENRY M. PARKER, *Sunapee, N. H.*

Red Phalarope (*Phalaropus fulicarius*) Wintering near Pensacola, Florida.—Until early in 1948, the Red Phalarope was considered only an accidental visitor in the Pensacola area, as it had been recorded there but twice in 32 years (Auk, 64: 473, 1947). On February 8, 1948, Mr. Frank Bray, of Pensacola, reported having seen a flock of phalaropes, numbering about 150 birds, on the waters of the Gulf of Mexico about 40 miles southwest of the entrance to Pensacola Bay. Contrary to published accounts of the habits of the Phalaropodidae, these birds were so wild that the boat

could not approach within shotgun range, and it was therefore impossible to secure a specimen for identification. However, Mr. Bray called the birds to the attention of Messrs. W. L. Boyden and C. C. Gunter, two week-end commercial fishermen of Pensacola, and requested that they keep a lookout on future trips into the area. On the following week-end (February 15) about 100 birds were reported and, on February 29, a close flock of 300 (est.) and several small groups. Finally, on March 14, 1948, Mr. Boyden fired several shots from an automatic rifle into a flock on the rise and killed one bird. I identified it as a Red Phalarope in winter plumage. The birds were last seen that season on March 21. On the chance that all these occurrences may have indicated only early migratory movement and not actual winter residence, it was decided to withhold comment until the true status of the species in this region could be established.

On November 26, 1948, Messrs. Boyden and Gunter again reported the presence of phalaropes—this time, a flock of about 30 birds. During the winter of 1948–1949, other flocks were seen at frequent intervals though not on every week-end trip. The greatest number counted on any one day was 100—the total of several small groups. The last reported that season were seen on March 6, 1949.

The 1949–1950 season was almost a repetition of the preceding one—the first single birds were seen late in October (date not reported), the first small flocks appeared on November 4. Birds were found commonly only on January 15 and 22, and the last birds of the season were reported on March 16, 1950.

Occurrence in the winter of 1950–1951 was reported by Mr. Gunter alone, and started with his observation of two birds on October 24 and ten on October 25. A second specimen was obtained on December 12, 1950, when a bird flew into the cabin of Mr. Gunter's boat and was captured uninjured. This bird was also identified by me as a Red Phalarope in winter plumage. The peak of abundance of that season came on January 7 and February 4, 1951, when totals of more than 100 birds were seen each day. The last birds of the season, a flock of about 75, were seen on March 17, 1951.

The 1951–1952 season started earlier than any of the others recorded above, when ten birds were seen on October 13. No others were seen until December 8, but a few birds have appeared on almost every subsequent week-end up to the date of this writing (January 15, 1952). So far this season, no great numbers have been seen.

The localities from which the reports of these five winters were made, when plotted on a map, subtend a 90° angle (southeast to southwest) with its apex at the entrance to Pensacola Bay, and the distances off shore vary from 5 to 50 miles. All but a few of the observations were made more than 30 miles out in the Gulf, and only one was as close inshore as 5 miles.

The Red Phalarope may now be considered a regular, and sometimes common, winter resident of the middle northern Gulf of Mexico. So far as this writer can discover, this series of observations provides a notable northward extension of the known winter range of this species.—FRANCIS M. WESTON, *2006 E. Jordan St., Pensacola, Florida.*

Extension of the Known Range of *Haliaeetus leucoryphus* (Pallas).—Peters (Check List of the Birds of the World, 1: 258, 1931) gives the range of this eagle as "South Russia through central Asia to Transbaikalia . . . ." This species is not listed by Mizuno in his "Check List of the Birds of Manchuria," 1934, nor mentioned in his later work, "Manchurian Birds in Life Colors," 1940. However the Pallas Fish-Eagle (*Haliaeetus leucoryphus*) is apparently a regular migrant and probably breeds at least as far east as central Manchuria.

In 1946 I obtained a small lot of specimens from A. S. Loukashkin, formerly Director of the Harbin Museum. Among these were four skins marked *Haliaeetus albicilla*, but subsequent examination disclosed that they were *Haliaeetus leucoryphus*. These skins were donated to the U. S. National Museum and are now identified as follows: U.S.N.M. No. 370447, ad. male collected July 18, 1940, by Weymarm and Loukashkin; No. 385931, imm. male collected August 17, 1940, by Loukashkin; No. 388849, ad. male collected August 18, 1940, by Loukashkin; and No. 385929, imm. male collected August 27, 1940, by Loukashkin. All four skins were taken at Dalainor Lake, Barga. Another specimen reported by Marquis Yamashina (Tori, 10 [49]: 516, 1939) was collected by Orii at Lamagulusu, 10 kilometers southeast of Dalainor Lake, on May 9, 1936. The capture of five specimens of this eagle in the Dalainor Lake region between May 9 and August 27 indicates that it probably breeds in this area.—L. R. WOLFE, *Kerrville, Texas.*

The Ruddy Turnstone (*Arenaria interpres*) at Beach Haven, New Jersey, in August, 1950.—Urner and Storer in Shorebirds on the New Jersey Coast, 1928–1938 (Auk, 66: 191) state: "None of the common species [of shorebirds], with the possible exception of the ruddy turnstone, could be said to have decreased in numbers." This statment recently was quoted by Palmer in his review of the article (Bird Banding, 23: 40).

Urner's highest daily counts on the New Jersey Coast from Newark Meadows to Brigantine in the fall migration for this species were as follows:

1928.	August 11	100 (Stone, Bird Studies at Old Cape May, 401)
1929.	August 1	125 (Stone, Bird Studies at Old Cape May, 401)
1930.	August 9	30 (Stone, Bird Studies at Old Cape May, 401)
1931.	August 9	100 (Stone, Bird Studies at Old Cape May, 401)
1932.	August 20	75 (Stone, Bird Studies at Old Cape May, 401)
1933.	August 25	34 (Stone, Bird Studies at Old Cape May, 401)
1934.	August 12	50 (Stone, Bird Studies at Old Cape May, 401)
1935.		84 (Urner and Storer, *op. cit.*: 181)
1936.		64 (Urner and Storer, *op. cit.*: 182)
1937.		107 (Urner and Storer, *op. cit.*: 183)

Urner's largest count at Beach Haven in 1928 was 50 on August 5. (Urner, Auk, 46: 325)

I spent the month of August, 1950, at Beach Haven, and made 23 trips to Beach Haven Inlet at the south end of Long Beach Island. During the month I had higher daily counts for Ruddy Turnstones (173), Least Sandpipers (550), and Sanderlings (3850) than any recorded by Urner for the fall. The daily pattern was about the same for all species as shown by Urner and Storer, *op. cit.*: 190–192. Western breeders such as Western Sandpipers and Long-billed Dowitchers tended to increase as the month progressed. Most interesting was the gradual disappearance of breeding plumage, particularly noteworthy in the Sanderling, Short-billed Dowitcher, Knot, Turnstone, and Black-bellied Plover.

Turnstones were found along the ocean from Beach Haven to the Inlet and along Barnegat Bay from the Inlet to the Lighthouse, but were most numerous in the pebbly part where the vegetation ended and the sand began near the south end of the island. They were recorded on each trip in the following numbers:

Date	Number seen	Date	Number seen	Date	Number seen
August 2.	7	August 11.	71	August 21.	45
August 3.	4	August 12.	21	August 22.	83
August 4.	68	August 14.	86	August 23.	173
August 5.	43	August 15.	53	August 24.	163
August 6.	15	August 16.	55	August 25.	78
August 7.	106	August 17.	146	August 26.	15
August 8.	90	August 19.	40	August 28.	36
August 10.	65	August 20.	15		

The Turnstone was seen every trip as were also the Sanderling, Semipalmated Sandpiper, Short-billed Dowitcher, Ring-necked Plover, and Least Sandpiper, but ranked behind all of these and the Knot in total numbers seen and behind all of these six and the Western Sandpiper in greatest number seen on one trip. However, the total of 1485 and average of 64.6 per trip and rank of 7 compares with Urner's 1935–1937 records of:

	Rank	Number of Trips seen	Number Trips	Total Number	Average per Trip when seen
1935	14	41	178	602	14.2
1936	15	53	171	693	13.13
1937	14	37	144	730	19.73

However, in considering relative rank, it must be remembered certain species like the Yellow-legs, Killdeer, Hudsonian Curlew, and Pectoral Sandpiper are rare or absent from Long Beach Island although common across Beach Haven Inlet in the Sheepshead Meadows, while Red-backed and Western sandpipers are commonest after the end of August. Furthermore, the Ruddy Turnstone migrates south on the Jersey Coast mainly in August.

Clearly the Ruddy Turnstone can hardly be said to have decreased in numbers along the New Jersey Coast between 1928 and 1950, at least on Long Beach Island. Its relative standing among the shorebirds would seem to be as given by Urner, common along with the Knot, but not abundant as is the Sanderling.—FREDERICK V. HEBARD, *1500 Walnut Street Building, Philadelphia 2, Pennsylvania.*

Breeding Notes on Two Panamanian Antbirds.—During a study in 1948 of birds attending army ants on Barro Colorado Island, Panama Canal Zone (Proc. Linn. Soc. N. Y., No. 63, in press), nests of two common antbirds were found. Though both nests were prematurely destroyed, I was able to obtain certain information on the incubation period of *Thamnophilus punctatus atrinucha*, and on the appearance of the nest, eggs, and newly-hatched young of *Microrhopias quixensis virgata*.

Thamnophilus punctatus atrinucha, the Slaty Antshrike, is the most common member of the Formicariidae in the forest of Barro Colorado Island. Nests with eggs have been recorded from December through July (Eisenmann, Smith. Misc. Coll., 117 [5]: 34, 1952). Yet the incubation period has not been reported, though Skutch has given a good account of a nesting (Auk, 51: 8–16, 1934). *Building of nest and incubation:* On February 3, I saw a male carrying material to an unfinished nest, a thin cup of black fibers and moss, suspended from a horizontal fork in a low tree. On February 4, 5, and 6, the nest was still empty and no bird was seen nearby. When next visited, on February 10, at 12:40 p.m., there was one egg, white with many umber spots around the large end. On February 11 at 2:00 p.m. I found two

eggs; the male was incubating. During visits on the following days both male and female were observed to incubate. Both permitted close approach before leaving the nest, sometimes remaining until I tapped the tree. On February 24 at 11:45 a.m. the male was incubating; there was no sign of hatching. On February 25, when I arrived at 12:30 p.m. there were two young in the nest—making an incubation period of about 14 days. This assumes, as Skutch believes, that the eggs are laid and normally hatch in the morning, and agrees with the incubation period of a related

TABLE

Microrhopias quixensis virgata

CARE OF YOUNG

Date	*Hours of observation*	*Total period observed*	*No. of feedings*		*Feeding intervals*		*Times brooded*		*Total time brooding*
			Male	*Female*	*greatest*	*average*	*Male*	*Female*	
2–6–48	10:20 a.m. to 2:30 p.m.	240 min.	1	4	77 min.	48 min.	0	3	80 min.
2–7–48	3:15 p.m. to 5:18 p.m.	122 min.	5	3	25 min.	15 min.	1	3	18 min.
2–8–48	1:30 p.m. to 3:30 p.m.	120 min.	1	2	40 min.	30 min.	0	0	0
2–10–48	9:42 a.m. to 10:55 a.m.	73 min.	2	3	56 min.	14 min.	0	0	0
2–11–48	1:00 p.m. to 1:30 p.m.	30 min.	0	1	25 min.		0	0	0
2–12–48	2:30	Nest found destroyed							

species, *T. bridgesi*, which he found to have an incubation period varying from 14 to 16 days (Auk, 62: 11, 17, 1945). *Condition and care of young:* The newly-hatched young had no down, showed dark under the skin on the upper dorsal tract and outer wing joints, and had light flesh-colored legs. Their eyes were closed, but they had strong voices and opened their mouths when handled. The female brooded the newly-hatched young. On February 26, the nest was watched from 8:20 to 9:20 a.m. The female and male took turns brooding the young, the female leaving when the male brought food to the young. When each member of the pair was brooding, the other could be heard from time to time calling from a distance. On February 27, at 11:45 a.m., the nest was found with one side torn away and the young gone.

Microrhopias quixensis virgata, the Dotted-winged Antwren, a small, noisy, arboreal species, is one of the leaders of the mixed bands that wander through the forest. Skutch found an unfinished nest on February 22, 1935, but other than that nothing

is reported of its breeding (Eisenmann, *op. cit.;* 35, 1952). *Nest and eggs:* On February 5, Robert Z. Brown showed me a nest under the canopy of large forest trees in a small bush, 42 inches above the ground. The nest was a deep cup, with thick sides, suspended from the fork of two branches, somewhat in the manner of a vireo nest. It was composed of dead leaves bound together with plant fibers and lined with finer black fibers. Measurements: outside diameter 3 inches, outside depth 3¾ inches, inside diameter 1¾ inches, inside depth 1¾ inches. The nest contained two eggs, white with small brown spots over the entire surface and with heavier blotches around the large end. *Development of young:* On February 6, at 10:30 a.m., two young were in the nest. A shell lay on the ground below. The egg sac was yellow. First day—February 6: No down, skin light flesh color, showing dark on outer wing joints and tail; mouth lining yellow; eyes closed. Third day—February 8: Dark ventral tract well defined; feet black; fear response present. Fifth day—February 10: Eyes open; dorsal tract showing; primary pins 3/16 inch long. Sixth day—February 11: Ventral tract feathers out of sheath, rufous colored; primaries ½ inch long. (Last record—nest found destroyed on February 12.) *Other notes:* When the nest was found, the male was incubating, but slipped away as soon as I came in sight. On the day of hatching, the female consumed a fecal sac; on the third day the male carried one away. From the first day the young opened their mouths when the nest was jarred. As the parents appeared to move their wings rapidly when they brought food, this may have functioned to vibrate the nest and serve as a mouth opening stimulus. Data on feeding and brooding of the young are summarized in the table.—R. A. Johnson, *State U. Teachers College, Oneonta, New York.*

Winter Feeding of the Red-wing (*Agelaius phoeniceus*).—During the winter of 1948–49 a group of about 35 Cowbirds (*Molothrus ater*), Grackles (*Quiscalus quiscula*) and Red-wings were present in Flushing (a suburb of New York City) in the same neighborhood as in previous years.

The birds were frequent visitors to the various feeding stations in the area, but the flock was difficult to locate away from a feeder, for the birds seldom made any sound. Tall sweet gums (*Liquidambar styraciflua*) are common in the region and often the group, especially the Red-wings, were detected working quietly on the seed capsules.

On December 19, 19.5 inches of snow fell on the area. From a window the following morning I watched an immature male Red-wing, probably a member of this flock, feeding in a manner new to me. The bird was on a dead ragweed (*Ambrosia trifida*) in a vacant lot. By forcing his bill along a stalk—he seemed to use the lower mandible most—the stem was split open and something was extracted, which was immediately eaten.

The first stalk I saw the Red-wing work on was split for a distance of about 15 inches. In one instance the bird started on a stalk that apparently held no food, for after splitting it open for only 6 inches he moved to another.

I watched this bird for almost 10 minutes and was impressed at the ease with which the plants were slit open. Only the main, upright stems were attacked, the lateral branches (averaging 0.25 inches in diameter) being ignored. Several English Sparrows (*Passer domesticus*) whose own sustenance was likewise buried under the snow, appeared interested in the Red-wing's manner of feeding, for they followed him about and watched intently from as close as two feet away.

Several days later I examined some of the ragweeds the bird had been feeding on and also some that were untouched. Along the stalks at intervals varying from three to six inches were small, orange-yellow larvae measuring from 0.3 to 0.4 inches

long and averaging 0.09 inches thick. They were moderately active when removed from the larval cases.

A number of larvae and some infested stalks were taken to the American Museum of Natural History and given to Dr. James McDunnough, an authority on the Lepidoptera, who placed them where they could transform. Unfortunately, nothing hatched but parasites. In a subsequent letter, Dr. McDunnough said it was quite safe to call the species *Epiblema strenuana* Walker, a tortricid moth that is a well-known borer in Ambrosia.

I am indebted to Mr. W. L. McAtee for reviewing the manuscript and suggesting ways to improve it.—RICHARD B. FISCHER, *Cornell University, Ithaca, New York.*

Surgery for Sexing and Observing Gonad Condition in Birds.—In many species of birds there are no suitable criteria by which the sex of individuals can be determined except by direct examination of the gonads. Even where there are differences in plumage, wing length, body weight, or coloration of bill and feet, sexing is often only a little better than guessing because of the overlap in these characters. In addition, many of the criteria useful during the breeding season (e. g., the incubation patch, song, nuptial plumage, and sexual behavior), are useless at other times of the year.

In field and laboratory studies it may be advantageous to know promptly and accurately the sex of individuals or to know precisely the condition of the ovary or testes. The latter is especially true in studies of photoperiodicity. The purpose of this paper is to describe in detail the surgical procedure used in sexing birds, to point out ways in which the operation will be useful in field and laboratory studies, and to indicate from my own results the degree of success that can be expected. This work was supported by a fellowship from the Bank of America-Giannini Foundation.

The operation consists of making a small incision on the left side between the last two ribs, thus permitting a satisfactory view of the ovary or left testis. The procedure varies somewhat according to the size and structure of the species concerned and according to the conditions under which the operation is performed. There are many advantages to be gained by bringing the birds into the laboratory, but satisfactory results can be had in the field. Elaborate sterility precautions are not necessary, but all instruments and materials should be scrupulously clean. When the operation is performed in the field it is best to maintain a special kit which can be kept separate from dissecting and skinning equipment.

Ether or intramuscular injections of a barbiturate can be used as an anesthetic. A barbiturate is preferred for smaller birds since ether causes excessive formation and accumulation of mucus in the respiratory tract. The birds should be anesthetized so that they will remain so for about 10 minutes; thus, the correct dosage of the anesthetic must be determined for each species. Sixty milligrams per kilogram of body weight is an approximate formula from which to work. With smaller birds I use a 2 per cent solution of Nembutal dissolved in 10 per cent ethanol, and inject in the following dosages: Oregon Junco (*Junco oreganus*) and Song Sparrow (*Melospiza melodia*), 0.05 ml.; White-crowned Sparrow (*Zonotrichia leucophrys*), 0.07 ml.; Brown Towhee (*Pipilo fuscus*) and Robin (*Turdus migratorius*), 0.10 ml.; and domestic pigeon (*Columba livia*), 1.5 ml. The Nembutal is injected into the breast muscle, and the operation is started as soon as the bird is anesthetized. Intraperitoneal injections are to be avoided because of complications with the air-sacs. If the operation has not been completed by the time the bird revives, a second injection consisting of one-half of the original dosage should be administered.

Birds of robin-size, or larger, should be tied to a board with the left side up and with the left leg extended and retracted with a band of cloth. Smaller birds can also be treated in this fashion, but I prefer to hold them in the left hand with the head and left wing under the thumb and the left leg retracted with the first and second fingers (figure 1). Except on birds heavily clothed with feathers, the outline of the lung (orange or pinkish), the ribs, the kidney, and other abdominal viscera can be seen. The feathers overlying the posterior end of the lung, the kidney, the thigh, and the last few ribs may be plucked. If left on, they will get in the way of the operation, especially when the incision is being sutured.

Figure 1. Manner in which small birds are held for surgery, area to be plucked, and site of incision for examining the gonads.

With the thigh retracted posteriorly, an incision is made through the skin and body wall between the last two ribs. The incision should be about 2 centimeters long in pigeons and about 0.5 to 1 centimeter in the Oregon Junco. In larger birds the skin should be cut first in order to locate accurately the position of the ribs, but in smaller birds the skin and the body wall can be cut at the same time with a pair of small, sharp-pointed scissors. The incision should be started ventrally and then carried dorsally between the ribs to near the posterior end of the lung (figure 1). The incision is actually made into the abdominal air-sacs, thus there is little danger of injuring the viscera. Great care must be taken, however, not to cut or injure the kidneys or lungs by extending the incision too far dorsally.

The incision can now be spread gently with a pair of blunt forceps. Small swabs (a bit of cotton rolled on a toothpick) should be handy for wiping up small drops of blood and for manipulating the viscera. A small wire retractor is useful for spreading the incision when working with small birds held in the hand. The beam of a dissecting lamp or flashlight mounted on a stand is directed into the body cavity while the gonads are being examined, and even measured with calipers, if desired.

In large birds, and with small ones released again in field studies, the body wall should be closed with two or more single sutures (light silk thread). The sutures should go around the ribs; the body wall is then pulled together tightly. The skin can be closed with several single sutures or by a continuous stitch. In water birds the incision should be painted with a 6 per cent celloidin solution. A single suture closing both the body wall and the skin is satisfactory for small birds which will be kept in captivity. Birds that are to be released should be placed in small cages overnight, or for at least four hours, after which the sutures should be rechecked. It is also advisable at this time to apply more celloidin to water birds.

Several hundred birds have been examined surgically in my studies during the last year with less than one per cent mortality. In nearly every case death was due to too much anesthetic, but occasionally the kidney was injured with the point of the

scissors; the resulting hemorrhage caused congestion of the respiratory tract via the air-sacs. Many birds were operated on weekly or biweekly for three to eight weeks without any ill effects. In such cases the incision was made on the old line, and healing was as prompt in the later operations as in the first. For the most part, these birds were kept in light chambers for photoperiodicity studies, and the operation seemed to have no effect on their ability to respond to day length increments since their response was similar to that of unoperated birds. Occasional weighing of the birds showed that the operation caused no loss of body weight, and in all respects they appeared to be normal and healthy.

In field studies 27 individuals of 5 species, ranging in size from Oregon Juncos to Brown Towhees, were examined surgically, color banded, and released for observation. These birds were watched for a period of several months, and at the end of this time only three could not be found and had presumably died. Two pairs of White-crowned Sparrows have been alive for over a year since operation and have also raised successful broods since then. The use of surgery for sexing birds in studies of nesting behavior, for determining sexual difference in call notes and song, etc., should be of great benefit. Gordon W. Gullion, in his study of sexual behavior and call notes of the American Coot (*Fulica americana*) (unpubl. M. A. thesis, Univ. of Calif., Berkeley, 1950), used the procedure outlined here with considerable success. He used ether as an anesthetic and the percentage of survival was high.—ROBERT E. BAILEY, *Division of Anatomy and Institute of Experimental Biology, University of California, Berkeley, California, March 13, 1952.*

Additional Notes on the Birds of Bimini, Bahamas.—The recent report on the birds of Bimini by Charles Vaurie (1953, Auk, 70: 38–48) deals with the summer birds (June–August). A visit in the spring (March 28 to April 18, 1952) has enabled me to make some interesting comparisons.

BREEDING BIRDS

Only few of the breeding birds seem to be permanent residents. Among the latter are the ground dove (*Columbigallina passerina*), the mocking bird (*Mimus polyglottos*), the Bahaman Woodstar (*Calliphlox evelynae*), the grassquit (*Tiaris bicolor*), the Thick-billed Vireo (*Vireo crassirostris*), and the sugarbird (*Coereba flaveola*). Others observed by Vaurie were either not observed at all or only as obvious spring arrivals.

Green Heron (*Butorides virescens*)—During many trips through the mangrove creeks, only a single bird was seen (April 11).

Yellow-crowned Night Heron (*Nyctanassa violacea*)—Not observed.

Clapper Rail (*Rallus longirostris*)—Not once heard.

Bridled Tern (*Sterna anaethetus*), Sooty Tern (*Sterna fuscata*), Least Tern (*Sterna albifrons*), and Common Noddy (*Anous stolidus*).—All four species were absent from their breeding colonies, as well as from the waters around Bimini.

White-crowned Pigeon (*Columba leucocephala*)—Not observed during many visits to their favorite habitats.

Mourning and Zenaida doves (*Zenaida macroura* and *aurita*)—Not observed.

Nighthawk (*Chordeiles minor*)—All calling nighthawks had the call of North American birds. There was no evidence that the native birds had yet arrived.

Gray Kingbird (*Tyrannus dominicensis*)—First seen April 8 (1), recorded also April 9 (1), April 14 (2), April 16 (1). All these birds were completely silent and were either passage migrants on the way to Florida and the Carolinas or recently arrived residents.

Black-whiskered Vireo (*Vireo altiloquus*)—Not found in the tree-groves described by Vaurie.

Red-winged Blackbird (*Agelaius phoeniceus*)—Not seen.

Greater Antillean Bullfinch (*Loxigilla violacea*)—Not seen.

Not all of these birds were necessarily absent from the islands, but a further check of their migratory status is suggested.

To the breeding birds must be added the *Barn Owl (*Tyto alba*). A nest with two young about 3–4 weeks old was found on April 4 in the water tank of the windmill of south Bimini. Rabbits were prominent in the food.

Migrants and Winter Residents

*Snowy Egret (*Egretta thula*)—Seen several times, particularly in the mangroves of Easter Cay.

*Sharp-shinned Hawk (*Accipiter velox*)—March 28 (1), March 29 (1), April 17 (1).

*Marsh Hawk (*Circus hudsonius*)—One adult male on April 2. Additional birds seen by other observers on subsequent days.

American Kestrel (*Falco sparverius*)—Not seen.

*Pigeon Hawk (*Falco columbarius*)—Individuals of this species were seen almost daily on all three islands. On one day it was possible to make sure that at least two individuals were involved. However, the total number of birds might have been even larger and probably was. They were beating back and forth, hunting for small birds. Observations were made along the west coast of south Bimini, all along north Bimini to the northernmost tip, and in east Bimini. The species is the dominant hawk on Bimini during this season.

*Upland Plover (*Bartramia longicauda*)—One individual, April 14 and 15 on the lawn of the Lerner Laboratory.

Laughing Gull (*Larus atricilla*)—Present in small numbers throughout my stay. Fourteen were counted April 17.

Royal Tern (*Thalasseus maximus*)—This is the only species of tern identified with certainty during my stay. Up to 20–25 different individuals could be seen in a day in the lagoon and in the waters around the islands.

*Yellow-billed Cuckoo (*Coccyzus americanus*)—One April 15, one April 17. A dead one picked up April 18. No mangrove cuckoos were obsreved.

Nighthawk (*Chordeiles minor*)—Flight of the North American subspecies on April 15 and April 17. Up to 8 or 9 birds in the air simultaneously.

Belted Kingfisher (*Ceryle alcyon*)—Seen throughout my stay. There were 2 or 3 in the mangroves of Easter Cay.

*Eastern Kingbird (*Tyrannus tyrannus*)—Three seen on Cat Cay (April 6).

Barn Swallow (*Hirundo rustica*)—A flock of these birds was present throughout my stay. They were hawking almost exclusively over the channel between north and south Bimini. I counted 9 birds on April 17. They were apparently roosting in one of the buildings at the edge of the water.

*Prothonotary Warbler (*Protonotaria citrea*)—One watched on April 7 for at least one-half hour, feeding at the beach on the arthropods on a dead fish, in company with 30 Palm Warblers.

*Black-poll Warbler (*Dendroica striata*)—Two, April 16.

*Hooded Warbler (*Wilsonia citrina*)—One, April 7.

*Indigo Bunting (*Passerina cyanea*)—One, April 15.

*Savannah Sparrow (*Passerculus sandwichensis*)—One, March 28.

Three species of warblers were common winter residents. The Palm Warbler

(*Dendroica palmarum*) was by far most common, the Prairie Warbler (*Dendroica discolor*) was next, and the Cape May Warbler (*Dendroica tigrina*) was third. These three species neatly divided the habitat among themselves: The Palm Warblers fed on and near the ground, the Prairie Warblers in bushes and low trees, and the Cape May Warblers in the higher trees. There were very few females among the Cape May Warblers. No Kirtland's Warblers were observed in spite of diligent search.

Birds marked with an asterisk are new records for Bimini. The 13 additions bring the known bird fauna of Bimini to 91 species.

There is much evidence of strong migration in spring. There were many migrants on the islands on April 6 and 7, after a period of more than twenty-four hours of north wind. Again, on April 15, after a western gale had blown throughout the night, there were many birds on the islands, some remaining on the 16th and 17th.—ERNST MAYR, *American Museum of Natural History, New York, N. Y.*

NOTES AND NEWS

The seventieth volume of 'The Auk' is now completed, and I would like to express my gratitude to the many people whose assistance has been indispensable. The members of the Editorial Committee, and especially Dr. Berger, have read and assessed many manuscripts, read proof, and helped in many other ways. Mrs. Faith Gillespie, in addition to secretarial work, reading proof, and helping to prepare the index, has offered many valuable suggestions. I am also much endebted to Elsa Hertz for typing letters and manuscripts.

The technical aspects of Dr. Preston's valuable paper on the shapes of birds' eggs were carefully checked by Professor Robert C. F. Bartels of the Mathematics Department of the University of Michigan. Drs. Alden H. Miller, George W. Salt, and Harrison B. Tordoff have given valued advice on manuscripts, and Milton B. Trautman and William A. Lunk have redrawn several illustrations.

We are also endebted to the many members who have contributed abstracts of recent literature. Following is a list of those who assisted with this work. (Because some abstracts have appeared over the initials of the abstractor, I have included in parenthesis the initials of these persons after their names.) Dean Amadon (D. A.), Paul H. Baldwin, William H. Behle (W. H. B.), Jean Delacour, Harvey I. Fisher (H. I. F.), Herbert Friedmann, Joseph J. Hickey (J. J. H.), H. Hofer, Hildegarde Howard (H. H.), Philip S. Humphrey (P. S. H.), S. Charles Kendeigh, Ernst Mayr (E. M.), Harold D. Mitchell (H. D. M.), Margaret Morse Nice, Homer Wayne Phillips, A. L. Rand, Chandler S. Robbins, Henri Seibert, Robert W. Storer (R. W. S.), James T. Tanner (J. T. T.), Charles Vaurie, J. Dan Webster (J. D. W.), and Alexander Wetmore. I particularly want to thank Philip S. Humphrey for his work in sorting, standardizing, and assembling the abstracts for this section. The coverage of journals has not been as complete as we would like to have it. Anyone interested in contributing to this section is urged to write to the Editor.

As in former years, the Committee on Biography has been assiduous in the preparation of obituaries. Thanks largely to the efforts of Dr. A. W. Schorger (Chairman) and Dr. T. S. Palmer, we now have enough obituaries in manuscript for several issues.

Finally, I wish to thank Josselyn Van Tyne for his valuable advice in many matters concerned with the editing of this journal.

Two members donated substantial amounts of money to the publication costs of 'The Auk.' Their making possible an increase in the size of this volume will be greatly appreciated by all the members. The fact that these donations were made without restrictions of any kind is particularly gratifying to the Editor, who considers them both a compliment and an expression of confidence.

The Eleventh International Ornithological Congress will meet May 29 to June 5, 1954, in Basel, Switzerland. Excursions have been planned for both before and after the Congress. We have received a supply of brochures giving information on the Congress and the field trips and including a registration form and application to present a paper. Those interested in attending may obtain a copy of this announcement by writing the Editor (Robert W. Storer, University of Michigan Museum of Zoology, Ann Arbor, Michigan).

The International Committee for Bird Preservation will hold its Ninth International Conference at Scanfs, Lower Engadine, Switzerland, May 23 to 28, 1954. The program has been arranged to enable those who so wish to attend the XI International Ornithological Congress. Further information may be obtained from Richard H. Pough, The American Museum of Natural History, New York 24, N. Y.

An investigation of the relationships between certain weather elements and the nocturnal migration of birds in the eastern half of the United States is being conducted by Mr. Gilbert S. Raynor of the Meteorology Group at The Brookhaven National Laboratory, Upton, Long Island, New York. Observers willing to assist in this study are requested to send to Mr. Raynor any of the following data obtained during the spring or fall migrations of 1953: actual observations by sight or hearing of migratory birds passing overhead during the night, reliable observations of the arrival or departure of migratory species or individuals on a known night. The observations obtained will be correlated with the pertinent meteorological data in an effort to discover those factors having a decisive influence on migration.

In May, the Southwestern Association of Naturalists was formed "to promote the field study of plants and animals, living and fossil, in the southwestern United States and Mexico, and to aid the scientific activities of its members." At present, the geographic scope of the organization includes Mexico and the states of Arizona, Arkansas, Kansas, Louisiana, New Mexico, Oklahoma, and Texas. Further information and membership blanks may be obtained from the Secretary-Treasurer, Dr. Herndon C. Dowling, University of Arkansas, Fayetteville.

Recent books received for review include "The California Condor" by Carl B. Koford, the western volume of Pettingill's "A Guide to Bird Finding," "Land Birds of America" by Robert Cushman Murphy and Dean Amadon, "Pheasant Breeding and Care" by Jean Delacour, and "The Birds of West and Equatorial Africa" (two volumes) by David A. Bannerman. Reviews of these works will appear in an early issue of 'The Auk.'

We have concluded an agreement with University Microfilms, authorizing the reproduction of a microfilm edition of 'The Auk.' Further information concerning this edition may be obtained by writing University Microfilms, 313 N. First Street, Ann Arbor, Michigan.

Correction of review:

"Parental Care and Its Evolution in Birds," by S. Charles Kendeigh.

In my review of Dr. Kendeigh's important book (Auk, 70, No. 3, July, 1953: 377) I inexcusably cited the series erroneously. The reference should read: "Illinois Biological Monographs, 22, Nos. 1–3, x + 356 pp." The book is published, I should add, by the University of Illinois Press, Urbana, Illinois.

I offer my sincere apologies to Dr. Kendeigh and to the readers of the Auk.—J. Van Tyne.

Letter to the Editor of the Auk

Dear Dr. Storer:

The library of the Edward Grey Institute of Field Ornithology at Oxford is now the most complete modern library on birds in Europe and is becoming increasingly used by zoology students and amateur ornithologists in Britain and by visitors from abroad. The most serious gap in the library at the present time is among the books on the birds of particular states of the U. S. A. It was therefore wondered whether readers of the Auk might have spare copies of some of these books which

they might care to give to the Institute. The Committee of the New York Zoological Society Program for Aid of Biological Research in Europe has given a grant to help in the purchase of such books, so that payment could be made. If anyone has such a book to offer, could they first write to Dr. David Lack, Director of the Edward Grey Institute, Botanic Garden, Oxford, to make sure that it has not already been obtained for the library.

Yours sincerely,

David Lack

RECENT LITERATURE

Las Aves de Chile: Su Conocimiento y sus Costumbres. Tomo Segundo.—J. D. GOODALL, A. W.. JOHNSON, and R. A. PHILIPPI B. Buenos Aires. 442 pp., col. figs. 1–49 + 22A + map, 42 half-tones, 2 line-cuts, 1951. $5.00.—The present volume completes this important work, the first part of which was published in 1946 (*cf.* The Auk, 64: 149, 1947). It follows the plan of the first volume and carries the discussions forward from the owls through the succeeding groups. A small number of additions are made to the groups treated in the first part, and the list thus stands to the number of 450 species and subspecies.

As previously, there is citation of the scientific, English, and local names, the general and local distribution, a brief description of the adult (and sometimes the immature) plumages, statistical measurements of many of the species, and an extended discussion of most of the forms. This last item embraces a wealth of original information, largely the result of the energetic field work of the authors. Being year-long residents of their country, they are in an unequalled position to settle questions of seasonal movements, behavior, nesting and other activities, and such problems. Some of this information has been given in previous publications, such as the discovery that Azara's Sand-Plover (*Charadrius collaris*) occurs in Chile as a regular visitor and possible breeder, but other facts are often newly recorded.

It is impossible to specify here all the interesting things of this sort that are reported. The authors' account of the wholly parasitic Black-headed Duck (*Heteronetta atricapilla*) and that of the rediscovered Lesser Buzzard (*Buteo albigula*) may be mentioned as examples. Whatever account is read, there is likely to be found in it something of special interest. Various problems that still await solution are cited, giving Chilean observers a good target toward which to direct their activities.

The principal purpose of the whole work is, however, popular and avowedly designed to encourage Chilean residents to acquire or develop an interest in the birds of their country. The descriptions and the colored illustrations of the species, as well as the accounts of the voices, behavior, and the like, should prove of great assistance in helping them to identify the species with which they may be unfamiliar and to learn more about those which are less strange.

The authors are to be congratulated on the completion of their task. The book still has no counterpart in any of the countries of Latin America, but it is to be hoped that the example set here will encourage the production of similar works elsewhere on the continent.—JOHN T. ZIMMER.

Birds and Mammals of the Sierra Nevada.—Lowell Sumner and Joseph S. Dixon. Berkeley: University of California Press. xvii + 484 pp. 8 col. pls., 46 phot., 2 maps. 1953. $7.50.

This volume deals with 167 kinds of birds (pp. 20–275) and 65 of mammals (pp. 276–462) recorded in the Kings Canyon and Sequoia national parks in California. It is intended to serve visitors to these two southern parks and many other persons interested in the "warm-blooded" fauna of this portion of the State's main mountain mass. The book does not cover the entire Sierra Nevada as the title implies (nor does it replace *Animal Life in the Yosemite* by Grinnell and Storer as hinted on the dust wrapper). Mr. Sumner has effectively combined the results of extensive field studies in these parks by the two authors separately at various times between 1933 and 1950 with records over many years by resident members of the Park Service staff. Local information for the birds has been supplemented by material on general distribution, migration, and food habits—principally from Bent's *Life Histories*.

Each species account includes main recognition characters, environments used, and habits in brief, together with precise records by locality and date within the two parks. The accounts of mammals are of similar pattern. Seven mammals are dealt with as "vanished species and questionable records."

The colored plates comprise 3 from Hoffman's *Birds of the Pacific States* and 5 from *Fur-bearing Mammals of California* by Grinnell, Dixon, and Linsdale; 16 birds and 7 mammals are shown. The 45 halftones show 8 additional birds and 16 mammals, several nests, dens, and workings, and 19 pictures of various local environments. Most of the photographs are by the second author, the late "Joe" Dixon, and provide another tribute to his skill and perseverance in obtaining photographs of animals.

This volume helps to round out a series of major publications on bird-mammal faunas in the Sierra-Cascade system of California: Mt. Shasta (Merriam, 1899); Lassen Park (Grinnell, Dixon, and Linsdale, 1930); Yosemite (Grinnell and Storer, 1924); the present book; San Bernardino range (Grinnell, 1908); and the San Jacinto (Grinnell and Swarth, 1913).

The Kings Canyon-Sequoia region is the last large mountain area in the State without access roads save at the western border and this makes it of especial value to certain species that elsewhere are far reduced or extinct. Its value is here demonstrated by the extended series of observations available on sooty grouse, wolverine, and a few other forms.

Of especial help to many amateur students are tables for distinguishing members of groups such as the Empidonax flycatchers (p. 123), the reddish finches (*Carpodacus*, rosy finch, and crossbill; pp. 225–26), and the chipmunks (pp. 381–82). Three introductory chapters deal briefly with broader topics. "Wildlife policies and problems" and "Human use of parks" set forth some philosophy and guiding principles used in administration; and "Life zones" is a brief exposition of the relations between plant life, animal distribution, topography, and climate in the area.

A few items merit adverse comment. The small maps omit many localities mentioned freely in the text; readers must seek topographic maps for such details. The lengths and especially weights (1.01 vs. 0.99 oz.) are scarcely characters to distinguish Mountain and Western bluebirds. There is a scattering of comment about "predator" control in areas other than national parks (e. g., California Jay, pp. 135–136) that scarcely belongs in the present work. The references include 82 printed sources and 78 of manuscript or processed items, the latter mainly in office files. Criticism aside, the book is a credit to the authors, to the National Park Service in providing the time and facilities necessary to its preparation, and to the publisher.—TRACY I. STORER.

Exploration du Parc National de l'Upemba, Fascicule 19, Oiseaux.—RENÉ VERHEYEN. Brussels: Institut des Parcs Nationaux du Congo Belge. 687 pp., 5 pls., 45 figs. in text. 31 March 1953. This volume is one of a series of monographs on the natural history of the Upemba National Park in the southeastern part of the Belgian Congo. As might be expected, the major portion of the report is an annotated list of the birds found in the park; approximately 425 forms are included, some on the basis of sight records. The species accounts begin with the name of the bird and a citation to the original description. These are followed by a list (usually in tabular form) of the specimens taken, which, in addition to the date and locality data, includes weights (to the nearest gram), measurements, condition of the gonads, and notes on the plumage. The accounts conclude with taxonomic and biological notes, the latter including information on season of occurrence, time of breeding, food habits, habitat preference, and molt. Two new subspecies, *Pyrrhurus*

scandens upembae and *Textor velatus upembae*, are described. This part of the work will undoubtedly be an important source of material on the birds of this part of Africa for some time to come. Students of avian reproduction will wish, however, that the collector had included actual measurements of the gonads instead of merely noting whether they were swollen or resting.

The first part of the book is composed of a long section on the zoogeography of the region. Among the topics discussed are: the biotopes found within the park and the birds which are characteristic of them, the geologic history of the region, and the origin of its fauna. Following this are 80 pages devoted to the morphology of some of the birds of the park. Morphological work is seldom reported in faunistic works, and this section deserves particular comment.

Some 50 pages and 24 figures are devoted to molt patterns and pterylography. The outlines of the spinal and ventral tracts on numerous species are illustrated, and more detailed illustrations of the pterylography of *Treron australis*, *Musophaga violacea*, *Francolinus albogularis*, and *Poliocephalus ruficollis* are presented. In *Treron*, the number of lines of feathers in the spinal tracts was found to correspond to the number of spinal nerves, and the arrangement of feathers in other species also suggests a metameric arrangement. In this connection, Verheyen mentions the earlier work of Sparvoli, Deelman, and Kaiser on the segmental arrangement of the innervation of the skin of the domestic pigeon. The relationships between feathers and their innervation and musculature are matters which deserve attention from morphologists and embryologists.

The last 30 pages of this section on morphology contain miscellaneous anatomical notes on many species. Special attention is given to the form of the sternum and the area of the pectoral muscles and also to the relationship between wing proportions and the ability to soar. However, there is also information on the trachea, coiling of the intestines, structure of the crop and gizzard, and several other organs. The problem of where to publish information of this nature is not a simple one, and some will doubtless object to including it in a work of this sort. Since the author has chosen to include it, I only hope that it will not become lost to anatomists.—ROBERT W. STORER.

Social Behaviour in Animals with Special Reference to Vertebrates.—N. Tinbergen. London: Methuen and Co. Ltd. xi + 150 pp., 8 pls., 67 figs. in text. $2.50. This addition to the list of Methuen's Monographs on Biological Subjects is a most welcome one. The author is one of the leading students of animal behavior and possesses the ability to express his views clearly and succinctly. His book will be useful and stimulating to anyone with an inquiring mind and an interest in natural history. It is a straightforward discussion of the major types of behavior, and it is pleasing to note that it is written in English and not in the jargon of the psychologists.

The introduction presents brief accounts of the behavior of three species, the Herring Gull, the Three-spined Stickleback, and the Grayling Butterfly, which the author has studied intensively. Other chapters treat mating behavior, family and group life, fighting, analysis of social co-operation, relations between different species, the growth of social organizations, and evolutionary aspects of social organization. The book concludes with some hints for research in animal sociology, a bibliography, and an index. Many of the discussions use as a starting point the behavior of one of the three species described in the introduction; in the development of his discussions, the author brings together material from many sources about a wide variety of animals.

It is to be hoped that this excellent little volume will stimulate more amateur ornithologists to contribute to the science of animal behavior. Many important

studies in this field have been made by non-professionals in this country, as well as abroad. As Tinbergen puts it (page 129), "It is not only possible, it is also very desirable that non-professionals go on to contribute, for lack of specialized training has advantages as well as disadvantages. Of course training gives knowledge and discipline of thought, but it often tends to smother originality of outlook. The amateur may approach the subject with a certain freshness of mind which may have a profound influence."—ROBERT W. STORER.

Birds of Mexico: A Guide for Field Identification.—Emmet Reid Blake. (Univ. Chicago Press). xxix + 644 pp. 1953. Price, $6.00.—For the first time we have a field guide to the birds of our neighboring republic of Mexico. Regardless of what merits or demerits it may have for actual use in the field, it will be welcomed as an up-to-date list of the birds of that country.

The species are arranged by families, the organization following Wetmore's classification. To identify a given species, the user must first discover to what family it belongs. For this purpose, line drawings of one or more species characteristic of the family are provided. There is, however, no written diagnosis to which a novice can turn for the salient structural and behavioral features which characterize the members of a given family. One must therefore learn the hard way how to characterize bird families in the field. After twelve years, I still recall seeing a small, yellow-breasted bird with a harsh call-note and scouring the flycatcher volume of Ridgway's 'Birds of North and Middle America' in a fruitless attempt to identify it; the bird was a tanager.

Once the family of a bird to be identified is known, the species can be worked out by means of a simple, and for the most part effective, dichotomous key and checked in the species accounts, which are divided into sections giving a description of the species, its distribution, subspecies if any, and remarks (including field characters). Granting that this is a valid approach to the problem (and this is certainly open to question), the text appears to be well prepared.

The illustrations, on the other hand, leave much to be desired. They have been prepared by a capable illustrator who has considerable skill in making line drawings but little knowledge of live birds. This is particularly apparent when one compares his drawing of a species like the Least Bittern, of which many excellent illustrations are available, with that of, say, the Tiger Heron, of which there are but few. This lack of knowledge of birds also is manifested in his failure to understand what can best help an observer to identify a bird. Most conspicuously absent are figures showing the different species of hawks in flight. One good plate of this kind is worth several pages of text, and such figures are particularly necessary in Mexico, where there are so many confusing species of hawks. If one assumes, as I do, that the purpose of illustrations in a field guide is to show the user the differences between species in as clear a manner as possible, it is distressing to find only three illustrations in which different species are shown side by side so that the user can readily make comparisons. Such illustrations have the additional virtue of taking up less space than the drawings of single species used through much of this book. For example, five of the fifteen Mexican quails are illustrated separately, using a total space equivalent to more than two pages. Two of these five species, the Gambel and Scaled quails, are illustrated in many books on North American birds. On the other hand, the Barred Quail (*Philortyx*), a common roadside species in a wide area of southern Mexico, is to my knowledge illustrated only in Gould's monograph of the Odontophorinae, a rare work available to few observers. How much more useful it would have been to have used the same amount of space in two one-page plates showing all

the species plus some of the Mexican races of the Bob-white, which differ from one another as much as do many full species. It is true that the individual birds would have had to be smaller, but all the important field characters could have been shown in such a way that the observer could easily discover the identity of the bird which he had just seen.

A lack of careful planning of the illustrations is also manifested in the use of a large line drawing of the Collared Aracari in the text, when the colored frontispiece shows the same species in virtually the same position. It might also be pointed out that the most conspicuous field mark of the Boat-billed Heron is the dark flanks and not the bill, which more often than not is seen in profile and is then difficult to distinguish from that of a night heron; the illustration of this species, however, shows only the head and neck, and the striking pattern is not emphasized in the text. Some 328 species are illustrated. Of these, 161, including such familiar species as the Canada Goose, Barn Swallow, White-breasted Nuthatch, and Cedar Waxwing, are covered in field guides to the birds in the United States. This seems like an unduly large proportion, but at least it has the virtues of stressing the similarities of the avifaunas of the two countries and of pointing out to the beginner that not all of the species which he finds will be new to him.

Writing a field guide to a relatively little-known area is a difficult task, and we cannot expect such a work to be complete. Blake has made a good start in pointing out what is and is not known about the field characters of Mexican birds. It is up to those of us who continue field work there to fill in the gaps.—ROBERT W. STORER.

The Dodo and Kindred Birds or The Extinct Birds of the Mascarine Islands. —MASAUJI HACHISUKA. London: H. F. and G. Witherby. xvi + 250 pp., 22 pls. (11 in color), 35 figures in text. Price 6£. To those who revel in collections of beautiful books, this latest work on the dodos will be most welcome; it is beautifully illustrated and handsomely printed, in many ways recalling the nineteenth-century monographs of Gould and others. True, the binding is cloth and the size moderate (9″ × 11″), but it was obviously produced in a spirit of opulence. The dedication is to the author's friend, the late King Boris III of Bulgaria; and it is also interesting to note that the work starts with the same quotation from Psalm CIV ('O Jehova, Quam ampla sunt Tua Opera!' etc.) with which Linnaeus began the tenth edition of his great 'Systema Naturae.'

The book contains a long introduction which includes a discussion of the Mascarine Islands, their history and avifauna, and a classification of the dodos and their relatives the solitaires. The first four chapters treat the Dodo of Mauritius, the Dodo of Réunion, the Solitaire of Rodriguez, and the Solitaire of Réunion. A final chapter covers the remaining 38 extinct birds of these islands. A bibliography and an index complete the work. Nineteen of the 42 birds are illustrated in color. One species, *Podiceps gadowi*, and three genera, *Pezocrex* (for *Didus herberti* Schlegel), *Paludiphilus* (for *Fulica newtoni* Milne-Edwards), and *Orphanopsar* (for *Necropsar leguati* Forbes) are formally described in the work.

The chief contributions of this book are the review of the history and literature of the dodos and the reproductions of several early drawings of the birds. As a scientific work, it is disappointing. In preparing the description of *Podiceps gadowi*, the author copied the earlier work of Newton and Gadow (Trans. Zool. Soc. London, 13, 1893: 289) nearly verbatim (four words were changed). In a casual attempt to bring the nomenclature of Newton and Gadow up to date, two of the scientific names were changed. As a result, the ulna (the only known element) of *P. gadowi* was described as both longer and shorter than that of *P. ruficollis* and both longer and shorter than that of *P. cristatus*.

Evidence for the existence of didine birds on the island of Réunion rests on four sketchy descriptions found in accounts of voyages to that island, a mention of a dodo-like bird seen in a shop in London, and several rather crude pictures. From this evidence, the author decided that there were two species, a dodo and a solitaire, on that island. Accordingly, he assigned each contemporary account to one species or the other, had a colored plate of each prepared, and devoted a chapter of the book to each, the last including descriptions of the birds and mention of their habits and palatability. The author admits that no contemporary account implied that there were two species on Réunion, yet he makes no mention of the rather obvious possibility that the White Solitaire may have been nothing more than a "gaunt" form of the White Dodo. (Plate VIII, showing the seasonal variation in the form of the Common Dodo, strongly suggests this possibility.) The author has built an elaborate superstructure on a weak foundation.

I hope that other publishers will follow Witherby's example in producing new monographs as handsome as this one and that the scientific value of the contents will be on a par with the excellence of the printing.—ROBERT W. STORER

Eyes in the Night. Bengt Berg. (Dietrich Reimer, Berlin), 164 pp., 57 black and white photographs, 1952. Price $2.75.—Written in story form, "Eyes in the Night" describes the life of the Eagle Owl (*Bubo bubo*) and of the animals found in the owl's world. Mr. Berg tells in charming manner of the inter-relationships between these animals and their habitat, tells of the balance of nature, and tells of the irrational attitude of man toward birds of prey and toward man's own hunting orgies. The book is, in part, a plea for nature- and conservation-consciousness, but above all it is a delightful story of Eagle Owls, both wild and captive.

Forming the framework for this animal biography, the superb photographs also are an end in themselves.

Mr. Berg's style is simple, refreshing, and captivating. One wishes to read the book through at one sitting. And having done so, one feels for awhile purged of the pressures and annoyances of a mechanistic society.

If there is a people who can profit most by attaining a better perspective on man's place in nature and on nature's place in American society it is that people of the United States. Let the author speak: "The limelight of our exalted human knowledge is gradually making us blind—blind in our vain search for imagined paradises—too blind to recognize the earthly paradise surrounding us, whose last remnants our very fertility is threatening to destroy, until in our blindness we are left with no choice but to destroy one another. Those who do not realize this may be content to breathe in the forest of factory chimneys, which for them replace the green-woods, and to suffocate in the ever-growing towns, where unhappy millions try to chase away the night with lights and noise, because they fear the gentle darkness. Yet there may be someone like me, who longs to pass some precious hours in forest and jungle, when night conquers day, and to sense its soft steps and soundless wingbeats."

Though he has written 23 books, only a few of Bengt Berg's works have been published in English. Let us hope that this is not the last.—ANDREW J. BERGER.

ALCORN, J. R. 1953. Food of the Common Merganser in Churchill County, Nevada. Condor, **55** (3): 151–152.

ALEXANDER, W. B. 1953. The index of Heron Population, 1952. British Birds, **46** (3): 100–103. The number of nests of *Ardea cinerea* was up nearly 5 per cent in comparison with the standard obtained over the past 25 years.

ALEXANDER, W. B. 1953. Ornithological illustration. Endeavour, **12** (47): 144–153, 19 figs.

ANDERSON, WILLIAM, AND A. W. MILLER. 1953. Hybridization of Cinnamon and Blue-winged teal in northeastern California. Condor, **55** (3): 152–153.

ARMSTRONG, EDWARD A. 1953. The behaviour and breeding biology of the Hebridean Wren. British Birds, **46** (2): 37–50. *Troglodytes t. hebridensis*, in contrast to *T. t. troglodytes*, is monogamous and both parents feed the young. Its song is more elaborate than that of the mainland form.

AUSTIN, OLIVER L., SR. 1953. The migration of the Common Tern (*Sterna hirundo*) in the Western Hemisphere. Bird-Banding, **24** (2): 39–55. An analysis of 709 recoveries of 386,752 Common Terns banded prior to Jan. 1, 1951, 0.182 per cent from the Atlantic Unit and 0.185 per cent from the Central Unit (Great Lakes). Map 1 shows 10 colonies from the Atlantic coast to Alberta at which these terns have been banded. Figure 2 shows recoveries from the Central Unit, figure 3 from the Atlantic Unit. The latter birds fly "southward along a narrow route which runs almost in a straight line down the coast to the Virginia Capes, across the West Indies to the northeast coast of South America," some of them wintering in Brazil. Most of the Great Lakes birds, instead of flying south down the Mississippi, fly east to the Atlantic Coast and follow it down to Georgia, where some go "westward around the coast of the Gulf of Mexico as far as Yucatan, the others continuing southward over Florida, the western end of Cuba and the Gulf of Mexico to Central America." The author considers the use of this round-about route as harking back to Pleistocene times, when the Great Lakes drained across the Appalachians. Ten tables give details as to time and place of recoveries. An important contribution.—MARGARET M. NICE.

BERGER, ANDREW J. 1953. The pterylosis of *Coua caerulea*. Wilson Bull., **65** (1): 12–17.

BERGER, ANDREW J. 1953. Protracted incubation behavior of a female American Goldfinch. Condor **55** (3): 151.

BERGER, ANDREW J. 1953. Three cases of twin embryos in passerine birds. Condor, **55** (3): 157–158.—One record for the Song Sparrow (*Melospiza melodia*), and two for the American Goldfinch (*Spinus tristis*).

BLAKE, E. R. 1953. A Colombian race of *Tinamus osgoodi*. Fieldiana. Zoology, **34** (18): 199–200.—New: *Tinamus osgoodi hershkovitzi*, type locality San Adolfo, Colombia. A notable range extension of this species described only in 1949, and hitherto known only from the Marcapata Valley, Peru.

BRAUNER, JOSEPH. 1953. Observations on the behavior of a captive Poor-will. Condor, **55** (2): 68–74.—Discusses the following subjects: feeding, scratching and comments on possible use of the pectinate claw on digit III, swaying, stretching, vision, preening, features of the mouth, dusting, eyeshine, and call-notes.

BRIAN, M. V. 1953. Species frequencies in random samples from animal populations. Jour. Animal Ecol. **22**: 57–64. 3 figs., 1 table. Recommends use of the negative binomial series, adjusted for the removal of zero term, for analysis of mixed populations. Illustrated with insects and birds.

BRIGGS, MARJORIE A. 1953. Unrecorded specimens of Neochloe brevipennis

taken in Oaxaca. Condor, **55** (3): 156–157.—Data on 11 specimens in the University of Florida collection.

BRODKORB, PIERCE. 1953. A Pliocene gull from Florida. Wilson Bull., **65** (2): 94–98, 1 fig.—*Larus elmorei* new sp., from Middle Pliocene deposits near Brewster, Polk Co., Florida.

BRODKORB, PIERCE. 1953. A review of the Pliocene loons. Condor, **55** (4): 211–214.

CHATFIELD, PAUL O., CHARLES P. LYMAN, AND LAURENCE IRVING. 1953. Physiological adaptation to cold of peripheral nerve in the leg of the Herring Gull (*Larus argentatus*). Amer. Journ. Physiol., **172:** 639–644.

CHRISTIANSEN, M., AND HOLGER MADSEN. 1948. *Eimeria bucephalae* n. sp. (Coccidia) pathogenic in Goldeneye (*Bucephala clangula* L.) in Denmark. Danish Rev. Game Biol. **1** (2): 61–73, 4 figs.

DANE, D. SURREY, J. A. R. MILES, AND M. G. P. STOKER. 1953. A disease of Manx shearwaters: further observations in the field. Jour. Animal Ecol. **22:** 123–133. 2 figs., 3 tables.—*P. puffinus* originally acquires disease from gulls, becomes epizootic in high populations where there is thick covering on the ground. Fatality occurs in over 75 per cent of cases.

DAVIS, JOHN. 1953. Birds of the Tzitzio region, Michoacan, Mexico. Condor, **55** (2): 90–98.—Annotated list of 83 species, of which 70 were collected.

DAVIS, JOHN. 1953. Precocious sexual development in the juvenal English Sparrow. Condor, **55** (3): 117–120.

DICKERMAN, ROBERT W., AND ALLAN R. PHILLIPS. 1953. First United States record of *Myiarchus nuttingi*. Condor, **55** (2): 101–102.

DILGER, WILLIAM C. 1953. Duetting in the Crimson-breasted Barbet. Condor, **55** (4): 220–221.

FARNER, DONALD S., AND L. R. MEWALT. 1953. The recording of diurnal activity patterns in caged birds. Bird-Banding, **24** (2): 55–65. After a brief history of investigations in Germany and Finland, a new system is described, illustrated with charts and photographs, as well as 2 graphs showing 48-hour activity records of two birds. The system has been used primarily in studying normal and experimentally induced *Zugunruhe* in White-crowned Sparrows (*Zonotrichia leucophrys gambeli*).

FISHER, HARVEY I. 1953. The Birds *in* Faunal and Archeological Researches in Yucatan Caves. Cranbrook Inst. Sci. Bull. **33:** 81–90. Representatives of 15 bird families and approximately 30 Recent species recorded.

GULLION, GORDON W. 1953. Observations on molting of the American Coot. Condor, **55** (2): 102–103.

GULLION, GORDON W. 1953. Additional bird records from southern Nevada. Condor, **55** (3): 160.—Annotated list of 4 species.

GULLION, GORDON W. 1953. Territorial behavior of the American Coot. Condor, **55** (4): 169–186.—Territorial behavior lasts throughout the year among resident American Coots (*Fulica americana*), but is at its lowest ebb during the winter. There is a discussion of territorial behavior of other members of the family Rallidae: *Fulica atra, F. armillata, F. leucoptera, Gallinula chloropus, Rallus elegans, R. longirostris, R. striatus, Amaurornis phoenicurus, Gallirallus troglodytes, Gallicrex cinerea, Porphyrio poliocephalus, Porzana carolina,* and *P. bicolor.*

HAMLING, H. H. 1953. Observations on the behaviour of birds in Southern Rhodesia. Ostrich, **24** (1): 9–16.

HAMMER, MARIE. 1948. Investigations on the feeding-habits of the House-sparrow (*Passer domesticus*) and the Tree-sparrow (*Passer montanus*). Danish

Rev. Game Biol. **1** (2): 1–59, 27 figs.—Study of 2657 House Sparrows and 501 Tree Sparrows showed that the former ate more grain; the latter, more weed seeds and insects.

HINDE, R. A. 1953. A possible explanation of paper-tearing in birds. British Birds, **46** (1): 21–23. Paper-tearing may be an expression of the food-searching drive, a useful activity for discovering new sources of food, even though the bird may not at the moment be hungry.

HOME, W. M. LOGAN. 1953. Paper-tearing by birds. British Birds, **46**: 16–21. Titmice, especially Blue Tits (*Parus caeruleus*) often enter houses and tear wallpaper, 1564 such cases being recorded; this happens most often in dry autumns.

HYDE, A. SIDNEY. 1953. Unusual records from western Colorado. Condor, **55** (4): 216.—Annotated list of 10 species.

IRWIN, MICHAEL P. STUART. 1953. Notes on some birds of Mashonaland, Southern Rhodesia. Ostrich, **24** (1): 37–49. Habits.

JENKINS, DAVID. 1953. Migration in late September and early October, 1951. British Birds, **46** (3): 77–98; (4): 121–131. Observations from Norway, Sweden, Finland, Germany, Holland, and Britain with 2 maps, 20 tables giving numbers of each species recorded at different stations each day, and 11 graphs showing wind strength, temperature and barometric pressure. Factors favorable for migration were high barometric pressure, minimum wind strength, and a marked fall in temperature.—MARGARET M. NICE.

JOHNSTON, RICHARD F., AND BENJAMIN HOCHMAN. 1953. Erythrocyte permeability and bird relationships. Condor, **55** (3): 154–155.—Gives the times of hemolysis of erythrocytes by four penetrating solutions. The data show that the Fox Sparrow (*Passerella iliaca*) and the Song Sparrow (*Melospiza melodia*) have more affinities to each other than to the House Finch (*Carpodacus mexicanus*).

JOLLIE, M. 1953. Plumages, molt, and racial status of Red Crossbills in northern Idaho. Condor, **55** (4): 193–197.

KELLOGG, PETER PAUL, AND ROBERT C. STEIN. 1953. Audio-spectrographic analysis of the songs of the Alder Flycatcher. Wilson Bull., **65** (2): 75–80. 2 figs.—Spectrograms show two distinctly different song types of *Empidonax traillii*.

KESSEL, BRINA. 1953. Distribution and migration of the European Starling in North America. Condor, **55** (2): 49–67.

KOELZ, WALTER N. 1952. New races of Indian birds. Journ. Zool. Soc. India, **4** (1): 37–46.—*Suthora ruficeps rufina, Sitta himalayensis lushaiensis, Ianthocincla rufogularis rufitincta, Trochalopteron phoeniceum khasium, Trochalopteron squamatum subsquamatum, Trochalopteron virgatum querulum, Stactocichla merulina toxostomina, Pomatorhinus erythrogenys erythrotis, Pomatorhinus ferruginosus formosus, Malacocincla abbotti amabilis, Alcippe nipalensis turensis, Schoeniparus dubius certus, Liothrix lutea luteola, Pteruthius erythropterus nocrecus, Pteruthius melanotis melanops, Xanthixus flavescens fugans, Pnoepyga pusilla pygmaea, Brachypteryx leucophrys geokichla, Larvivora brunnea angamea, Notodela leucura rhipidura, Zoothera marginata tenebrosa, Cyornis sapphira coelicolor, Pericrocotus brevirostris sanguineus, Pericrocotus brevirostris aureus, Phylloscopus maculipennis papilio, Abroscopus superciliaris bambusicola, "Suya" crinigera nebulosa, Ploceus philippinus sardarpateli, Delichon nipalensis bartletti, Aethopyga nipalensis ripleyi, Hypopicus hyperythrus haemorrhous, Dendrocopos nanus gigantiusculus, Sasia ochracea ferruginea, Cuculus poliocephalus assamicus, Glaucidium brodiei garoense, Otus bakkamoena alboniger, Otus spilocephalus rupchandi*, new subspecies.

KORTLANDT, A. A population study of the European Cormorant in Holland, based

on counting and banding data. MS of author's English translation (121 pages of text, 22 photographs, 5 charts) has been filed in the Division of Birds, U. S. National Museum, Washington 25, D. C. The translation can be studied at the National Museum or microfilm copies can be ordered. Original Dutch version was published in Ardea **31**, 1942. Some of the author's conclusions were summarized by D. S. Farmer in Bird-Banding 17 (3).

This paper is important not only because of its information on biology, ecology, behavior, and population dynamics, but because of its statistical treatment of reproduction, population turnover, and mortality in different sex and age groups. The translation was prepared for publication, and since publication plans have not materialized the MS has been deposited where it will be generally available and can receive proper care.

KURODA, NAGAMICHI. 1953. A wild hybrid between Branta and Anser obtained in Japan. Condor, **55** (2): 100–101.

LAMM, DONALD W. 1953. Comments on certain records from northern Sul Do Save, Mozambique. Ostrich, **24** (1): 2–8.

LISTER, M. D. 1953. Secondary song: a tentative classification. British Birds, **46** (4): 139–143.

MARSHALL, DAVID B., AND LEROY W. GILES. 1953. Recent observations on birds of Anaho Island, Pyramid Lake, Nevada. Condor, **55** (3): 105–116.—Reports the present status of nesting populations of the following birds: *Pelecanus erythrorhynchus, Phalacrocorax auritus, Ardea herodias, Branta canadensis, Anas platyrhynchos, Mergus merganser americanus, Larus californicus*, and *Hydroprogne caspia*.

MATHESON, COLIN. 1953. The Partridge in Wales: a survey of Gamebook records. British Birds, **46** (2): 57–64. Records of bags of *Perdix perdix* are given from an estate in Wales from 1854 to 1951 and are compared with other localities; a marked periodicity is found, with peaks at average intervals of 9.2 years. Populations have now "dwindled almost to vanishing point," due to urbanization of estates, changed methods of farming, decrease in keepering, and increase in depredations by sheepdogs and foxes.—MARGARET M. NICE.

MAY, REG., AND JAMES FISHER. 1953. A Collared Turtle Dove in England. British Birds, **46** (2): 51–53. A male *Streptopelia decaocto* was present in Lincolnshire from May to August 1952, proclaiming territory near chicken-runs and marginal land. It is not certain whether it was an escape from captivity or a pioneer. During the last 20 years this species has made a phenomenal spread northwest across Europe which has brought it 1200 miles to Holland, France, and Denmark, in "hops" at times of well over 150 miles.—MARGARET M. NICE.

MILLER, ALDEN H. 1953. The incubation period of the Hutton Vireo. Condor, **55** (4): 221.

MICHENER, JOSEPHINE R. 1953. Molt and variation in plumage pattern of Mockingbirds at Pasadena, California. Condor, **55** (2): 75–89.

MOORE, NORMAN C. 1953. A balance for weighing tits without capture. British Birds, **46** (3): 103–105. An ingenious method for weighing titmice as they feed on bait, illustrated with a chart and photograph.

MOREJOHN, VICTOR G. 1953. English Sparrows nesting within nest of Red-tailed Hawks. Condor, **55** (3): 161–162.

NELSON, URBAN C. 1953. Northern record of nesting of Red-necked Grebe. Condor, **55** (4): 220.—Nest with three eggs in Arctic Alaska.

NICE, MARGARET MORSE. 1953. The question of ten-day incubation periods. Wilson Bull., **65** (2): 81–93.—A critical survey of the literature and other data

proved that authenticated incubation periods of less than 11 days are rare. The supposedly short incubation periods of *Zosterops* and *Molothrus ater* are actually of 11 to 12 days.

NORGARB, C., AND J. LASBREY. 1953. Jackal buzzards. Ostrich, **24** (1): 33–36. Life history of *Buteo rufofuscus*.

NORRIS, C. A. 1953. The birds of Bardsey Island in 1952. British Birds, **46** (4): 131–137. Birds seen June 25 and 26, 1952, on this small island off the coast of Wales.

PARKES, KENNETH C. 1953. The incubation patch in males of the suborder Tyranni. Condor, **55** (4): 218–219.

PENNIE, IAN D. 1953. The Arctic Skua in Caithness. British Birds, **46** (3): 105–108. Population counts of *Stercorarius parasiticus*.

PETERLE, TONY J. 1953. An extended incubation period of the Ruffed Grouse. Wilson Bull., **65** (2): 119.—*Bonasa umbellus*, 70 days on infertile eggs.

RAINES, R. J. 1953. October passerine migration on the South Lancashire coast. British Birds, **46** (1): 24–34. With 2 tables and 4 maps.

RAND, A. L. 1953. Use of Snake Skins in Birds' Nests. Nat. Hist. Misc. (Chicago), No. 125: pp. 1–5.

RAND, A. L. 1953. Notes on Flycatchers of Genus *Batis*. Fieldiana, Zoology, **34** (10): 133–148.—The species treated are *B. minor*, 7 races; *B. molitor*, 3 races, with additional variation of less than subspecific value described; *Batis perkeo* (range extended to Tanganyika Territory); *Batis soror* (shown to be a species, not a race of *B. molitor*).

RAND, A. L., AND R. L. FLEMING. 1953. A New Fruit Pigeon from Nepal. Fieldiana. Zoology, **34** (19): 201–202.—New: *Treron pompadora conoveri*, type locality.—Butwal, Nepal.

REED, PARKER C. 1953. Danger of leg mutilation from the use of metal color bands. Bird-Banding, **24** (2): 65–67. Two metal bands should never be used on one leg, for the lower one will "flatten and thicken until it is a hazard to the bird's leg, if not its life." Photographs are given of these flanged and dangerous bands.

RETT, EGMONT Z. 1953. Additional notes on the birds of Santa Rosa Island, California. Condor, **55** (3): 156.—Annotated list of 8 species; 8 other species are mentioned.

RICHARDS, LAWRENCE P., AND PAUL H. BALDWIN. 1953. Recent records of some Hawaiian honeycreepers. Condor, **55** (4): 221–222.—Annotated list of 7 species.

SCHMIDT, KARL P. 1953. A visit to Karewa Island, home of the Tuatara. Fieldiana. Zoology, **34** (12): 153–164.—Contains notes on the nesting of the Flesh-footed Shearwater (*Puffinus carneipes*).

SELANDER, ROBERT K. 1953. Notes on the Red Crossbills of the Uinta and Wasatch Mountains, Utah. Condor, **55** (3): 158–160.—Discussion and measurements of 28 specimens of *Loxia curvirostra bendirei* and *L. c. grinnelli*.

SELANDER, ROBERT K., AND MIGUEL ALVAREZ DEL TORO. 1953. The breeding distribution of Chordeiles minor in Mexico. Condor, **55** (3): 160–161.

SHELFORD, V. E. 1953. An experimental approach to the study of plant and animal reproductivity and population with a life science building plan. Ecol. **34**: 422–426. 1 fig.—Need of outdoor space next to biological laboratories for experimental studies of birds and other animals under natural light conditions.

C. J. SKEAD. 1952. The Status of the Cattle Egret, *Ardeola ibis*, in the Eastern Cape Province. The Ostrich **23** (3): 186–218. In recent times the Cattle Egret *Bubulcus ibis*) has been increasing in numbers in South Africa. Skead presents much detailed information on the change in status in Cape Province east of the

twenty-fourth meridian. There were few occurrences before 1900, and the first breeding record was in 1910. Observations of individuals rose rapidly in the 1930s, and there were additional breeding records. The increase continued after 1940, and there are now thirty breeding colonies, the largest with 2000 individuals. Nesting and roosting habits, cross-country movements, and evidence of migration are reviewed, but no conclusions are reached regarding the reason for the increase or the direction from which the birds came. Skead points out that the Cattle Egret has been found in northern South America since 1937, and that it was twice recorded in the eastern United States in 1952.—HUSTACE H. POOR.

SKUTCH, ALEXANDER F. 1953. The White-throated Magpie-Jay. Wilson Bull., **65** (2): 68–74.—Observations of the nesting of *Calocitta formosa*, in Central America, and remarks on its habit of more than one individual feeding an incubating female.

SKUTCH, ALEXANDER F. 1953. Life history of the Southern House Wren. Condor, **55** (3): 121–149.

STANFORD, W. P. 1953. Some sea birds in winter off the S. W. Cape [of Good Hope]. Ostrich, **24** (1): 17–26.

STEWART, ROBERT E. 1953. A life history study of the Yellow-throat. Wilson Bull., **65** (2): 99–115, 1 table.—Breeding habitats, populations, associated habits, and success of *Geothlypis trichas*.

STRAW, RICHARD M. 1953. Additional notes on Korean birds. Condor, **55** (3): 153–154.—Annotated list of 13 species.

SUTTON, GEORGE MIKSCH. 1953. Bronzed Woodpecker. Wilson Bull., **65** (2): 64–67, 1 colored plate (by author).—A brief description of the habits, appearance, and range (parts of Mexico) of *Piculus aeruginosus*.

TALMADGE, ROBERT R. 1953. Rufous Hummingbird nesting in California. Condor, **55** (3): 155–156.

TASHIAN, RICHARD E. 1953. The birds of southeastern Guatemala. Condor, **55** (4): 198–210.

THOMSON, A. LANDSBOROUGH. 1953. The migration of British Auks (Alcidae) as shown by the results of marking. British Birds, **46** (1): 3–15.

TUTT, H. R. 1953. Notes on the nesting of a pair of Jays inside a hollow tree. British Birds, **46** (3): 98–99. Photographs of *Garrulus glandarius* feeding young in a hole in an apple tree.

VAURIE, CHARLES. 1953. Summer records and observations on the island of Tiburón, Sonora, México. Condor, **55** (4): 217–218.—A description of the island and an annotated list of 13 species, of which the following are new records for the island: *Guara alba, Coragyps atratus, Numenius americanus, Columbigallina passerina, Tachycineta thalassina, Tangavius aeneus*.

VOOUS, K. H. 1953. The geographical variation of the Jay (*Garrulus glandarius*) in Europe: a study on individual variation. Beaufortia, **2** (30): 1–41, 16 figs.—A revision based on a critical examination of 965 specimens. The author recognizes eleven races in Europe, two of them (*Garrulus glandarius yugoslavicus* and *G. g. lusitanicus*) described as new. Variation in size between first-year birds and adults is not discussed; standard deviations for wing length are consequently high.

WILLIAMS, C. B. 1953. The relative abundance of different species in a wild animal population. Jour. Animal Ecol. **22**: 14–31. 9 fig., 8 tables.—Mathematical treatment indicates that the distribution of species with different numbers of individuals in a mixed population is nearer to the log-normal than to the log-series form. Points are illustrated by insect and bird populations.

WILLIAMS, GEORGE G. 1953. Wilson Phalaropes as commensals. Condor, **55** (3):

158.—Describes association of Wilson Phalaropes (*Steganopus tricolor*) with Avocets (*Recurvirostra americana*).

WILLIAMSON, KENNETH. 1953. Flocking behaviour of Oyster-catchers. British Birds, **46** (3): 108–110. Behavior of some 1500 *Haematopus ostralegus* in response to a rising tide.

WOLFSON, ALBERT. 1953. Gonadal and fat response to a 5 : 1 ratio of light to darkness in the White-throated Sparrow. Condor, **55** (4): 187–192.

The Records of the American Ornithologists' Union: What they contain and where to find them.

Editor, The Auk:

On September 26, the American Ornithologists' Union reached its 70th birthday. Organized in 1883, the intervening three score and ten years, equivalent to the life span of an ordinary individual, include the activities of nearly 10,000 persons who have been associated with the Union for longer or shorter periods. About 3000 of these are now members, but 1,200 are dead, and about 5,800 members have dropped out. The records of the organization are widely scattered, some in print and some in manuscript, but they all fall into 6 main groups: administrative, bibliographical, biographical, fiscal, historical, and miscellaneous.

If a member is curious to know how many posthumous members have been elected (Louis Brasil in 1919, F. J. Mallory in 1942, and B. J. Howell in 1946), why Lower California was included with the United States as the result of a deal between William Brewster and Elliott Coues, why the original charter incorporating the Union was dissolved, when the Union suffered from financial stringency and what remedies were applied, he is likely to spend considerable time and energy in looking up the desired information.

Administrative records containing lists of members, reports of annual meetings, including election of officers, members and lists of papers on programs are published in "The Auk" or the semicentennial report on "Progress of American Ornithology, 1883–1923" and a set of the Minute Books (lacking 2 volumes) of the Council is filed in the Manuscript Division of the Library of Congress, Washington, D. C. Bibliographical records may be found in the decennial Indexes of "The Auk" or the privately published lists of publications of various authors which include many titles not available elsewhere. Biographical records including about 70 Memorials and more than 1000 obituary notices are listed in the Biographical Indexes of the American Ornithologists' Union (last list 1952). Fiscal records have been published in "The Auk" since 1938, but earlier records are still in manuscript. Historical records are included in J. A. Allen's "Retrospect," 1890, and in the data on various subjects in the Semicentennial Report of "Progress of American Ornithology" and "The American Ornithologists' Union at a Glance" (Auk, 1948, p. 496). Miscellaneous records include a variety of material such as the Deane Collection of Portraits of Ornithologists and the accompanying index in the Prints and Photograph Division of the Library of Congress, the Bendire Correspondence and the Von Berlepsch correspondence in several languages, in the manuscript Division of the Library of Congress, and the general collection of ornithological correspondence in the Wood Library of McGill University in Montreal, Canada.

At least 10 members still on the rolls of the Union have maintained their membership for 60 years or more: F. H. Allen 65, C. F. Batchelder 70, A. C. Bent 64, B. S. Bowdish 61, A. M. Ingersoll 68, H. C. Oberholser 65, T. S. Palmer 65, E. A. Preble 61, R. M. Strong 64, and W. E. C. Todd 63.

T. S. Palmer

OBITUARIES

CHARLES EDGAR CONKLIN, an Associate of the American Ornithologists' Union, elected in 1915, died in Roslyn, New York, September 8, 1916, at the age of 41. He was born in Roslyn August 14, 1875, and was educated in the public schools and in a business college. During the last 20 years of his life he was secretary of the Roslyn Savings Bank. He was much interested in botany and nature study and was a member of the Audubon Society.

Mr. Conklin did not publish his observations on birds, but a heronry near Roslyn, in which he was much interested, and which he visited with Dr. Frank M. Chapman, was photographed and described in Chapman's 'Bird Studies with a Camera.'—T. S. PALMER.

CHARLES HENRY DAVIS, an Associate of the American Ornithologists' Union, elected in 1906, died in Saginaw, Michigan, October 5, 1918, at the age of 70. He was born in North Andover, Massachusetts, August 25, 1848, and was the son of Edmund and Sarah Folsom Davis. His boyhood was spent on a farm about two miles from Portsmouth, New Hampshire. He attended the District School, at 10 years of age he entered the grammar school, and at 14, the Portsmouth High School from which he graduated at 18. In the winter of 1864, he entered the full course at Eastman Business College, Poughkeepsie, New York, and after graduation returned to the farm, and for four years engaged in market gardening with his brother.

In the fall of 1869, he went to Saginaw, Michigan, and began his career in the lumber business by piling lumber with Wright and Pearson, by whom he was employed. Three months later he was made bookkeeper in the firm and soon after was placed in charge of the affairs of Seymour Coleman, who operated the Pearson mills.

In his later years he was associated with several companies engaged in cutting pine timber, in Minnesota, Louisiana, and on the Pacific Coast. To escape from the long winters in the North, he maintained a winter home in Pasadena, California.—T. S. PALMER.

WALLACE SHERWIN DRAPER, an Associate of the American Ornithologists' Union, died in Wayland, Massachusetts, April 13, 1925, at the age of 74. He was born in Wayland, September 7, 1851, and was elected an Associate of the Union in 1920. Apparently he published nothing on birds.—T. S. PALMER.

MARY DRUMMOND, of Lake Forest, Illinois, an Associate of the American Ornithologists' Union, elected in 1904, died April 22, 1926. She was a sister of Ellen Sheldon Drummond Farwell whose book, "Observations near Chicago" was published posthumously. She prepared the introduction, explaining the conditions under which these observations were made.—T. S. PALMER.

CHARLES DUPOND, of Bruxelles, Belgium, elected a Corresponding Fellow of the American Ornithologists' Union in 1932, died at Laken on November 20, 1952, after a long and painful illness. This well-known and popular figure among European ornithologists was born at Slype (Flandre Occidentale) April 8, 1872. His thin silhouette, long beard, and cronstadt hat had long been a welcome and familiar sight at all ornithological meetings, conventions and congresses held in the Old World. He was liked by all for his great kindness, reserve and courtesy. He had rendered eminent service to the cause of Belgian ornithology. For thirty years he edited 'Le Gerfaut' and kept it up through difficult times. He had charge since 1927 of the bird section at the 'Institute Royal des Sciences naturelles de Belgique,' where he built up

a good collection of native birds, also organizing bird banding in his country. He was for many years the principal support of Belgian ornithology.

Charles Dupond will be greatly missed, but he leaves after him a group of bird students who will carry on his good work. They owe him a great deal.—JEAN DELACOUR.

ELLEN SHELDON DRUMMOND FARWELL (MRS. JOHN VILLERS FARWELL), an Associate of the American Ornithologists' Union, died at Lake Forest, Illinois, August 6, 1912, in her fifty-third year. She was born in Chicago, December 29, 1859, and was elected an Associate of the Union in 1896. In the following year she became one of the chief organizers of the Illinois Audubon Society and was a director or vice-president during the rest of her life.

She was much interested in birds and kept notes on the various species that she observed from time to time. Eight years after her death these notes were published under the title 'Bird Observations near Chicago,' with an introduction by her sister, Mary Drummond. The illustrations consisted of her portrait as a frontispiece, photographs of birds, and a photograph of her home 'Ardleigh' at Lake Forest, near Chicago.

In the summer of 1907, she made a trip to Europe, visiting England, Switzerland, and Italy; and in February and March 1907 she went south to Savannah, Georgia. Notes on the various species encountered on these trips are included in her book.—T. S. PALMER.

ALVA HOWARD FELGER, an Honorary Life Associate of the American Ornithologists' Union, was elected in 1898. He was born at Geneseo, Illinois, April 16, 1868. His academic training was received at the University of Michigan (Ph. B., 1895) and Denver University (M.A., 1925). After leaving the University of Michigan, he spent one year teaching in a private boys' school at Racine, Wisconsin, and another year teaching at Lake Charles College, Lake Charles, Louisiana. Beginning in 1897, he taught biology at the North High School, Denver, Colorado, until his retirement in 1941.

Mr. Felger was always interested in agriculture and horticulture, and in 1916 purchased a farm at Broomfield, Colorado, with a view to a pleasant retirement. He was an ardent student of birds and left a collection of aproximately 2,000 bird skins. Twenty articles under his name appeared in the 'Auk' between 1901 and 1919. While returning from church on Easter Sunday, he was struck by a car. Hospitalized for the succeeding five months, he died in Denver on September 15, 1952.—A. W. SCHORGER.

HOMER LENOIR FERGUSON, a Life Associate of the American Ornithologists' Union, elected in 1926, died at his home in Warwick, Virginia, on March 14, 1953. He was born in Waynesville, North Carolina, on March 6, 1873. Following graduation from the U. S. Naval Academy (1892), and Glasgow University (1895), he entered upon a long and highly successful career in marine construction. He was connected with the Newport News Shipping and Dry Dock Company from 1905. He resigned as president of this organization in 1946, but remained chairman of the board up to the time of his death.

He was president of the Chamber of Commerce of the United States (1919-20), member of the National Industrial Conference Board, trustee of the Carnegie Institution, Washington, and president and chairman of the board of trustees of the Mariners' Museum, Newport News. Honorary degrees were given him by Washington and Lee University, University of Richmond, Worcester Polytechnic Institute,

Duke University, Rensselaer Polytechnic Institute, and William and Mary College. He was very much interested in birds, especially game birds, and watched with great pleasure the song birds at the feeding stations maintained at his home.—A. W. SCHORGER.

WILLIAM LOVELL FINLEY, a life member of the American Ornithologists' Union, died at Portland, Oregon, on June 29, 1953, at the age of 76. He was born at Santa Clara, California, August 9, 1876 and moved to Portland, Oregon, with his parents May 11, 1887. He attended the public schools of Portland, graduated from the Portland High School in 1896, and then took a year of post graduate work at the Portland Academy. He entered the University of California in 1899, graduated with the degree of A.B. in 1903, and took a year of post graduate work there in 1903–1904. A position with the Reviews of Reviews Company of New York was held during 1905–1906. In 1906, he married Nellie Irene Barnhart, A.B., University of California, 1903, who with his two children, Mrs. Arthur Newton Pack of Tucson, Arizona, and William Lovell Finley Jr., of Portland, Oregon, survive him.

During his early boyhood he developed a keen interest in birds, and with his life-long friend, Herman T. Bohlman, started a collection of birds' eggs and skins. Later he became interested in bird photography, in which field he soon became nationally known. His series of pictures of the California Condor, waterfowl of the eastern Oregon lakes, and sea bird colonies off the Pacific Coast, were outstanding among wildlife photographs of that period. He became an expert in making moving pictures, not only of birds, but of mammals, ranging from the big brown bears of Alaska and nearly all the big game of western North America, to studies of smaller species. His early movies of antelope (1915) and the courting display of the Sage Grouse (1917) were classics of the time.

For many years he was a leader among the conservationists of America. His reports and photographs of the wildlife at Malheur Lake, Lower Klamath Lake, and Three Arch Rocks won him the support of President Theodore Roosevelt, who, by proclamation, made these areas National Wildlife Refuges. Finley was the first State Game Warden (1911) for Oregon, under the present form of game management. Later he was State Biologist. His were the first bird reports sent from Oregon to the National Audubon Society.

With his wife as co-author he published three books, "American Birds" (1907), "Little Bird Blue" (1915), and "Wild Animal Pets" (1928). His notes in "The Auk" and other scientific journals were not numerous but were important, while his writings on conservation and wildlife were numbered in hundreds, nearly a complete file of which is housed in the conservation library at the University of California. He collaborated with the National Audubon Society, Biological Survey, National Park Service, U. S. Forest Service, Isaac Walton League, National Wildlife Federation, American Nature Association, and many other local and national organizations interested in nature and conservation. Among his intimate friends were John Burroughs, Dallas Lore Sharp, Jay N. Darling, William Dutcher, Thorton Burgess, and T. Gilbert Pearson. He was a member of the American Society of Mammalogists, Pacific Northwest Bird and Mammal Society, Wildlife Society, Cooper Club, Isaac Walton League, National Audubon Society, and National Wildlife Society. In 1931 Oregon State College honored him with the degree of Doctor of Science. In addition to his many activities in local and national organizations, he spent much of the past thirty years lecturing on birds and conservation over much of the nation.

William Lovell Finley devoted his life to the study of birds, and to better protection for all natures creatures. He was loyal to his many friends and tireless in his

chosen work. The passing of "Bill" Finley is a great loss to his co-workers in the field of conservation.—STANLEY G. JEWETT.

JOSEPH LARKE FLOYD, an Associate of the American Ornithologists' Union, died in Canton, Ohio, February 5, 1950, at the age of 75. He was born in Noble County, Ohio, in 1876, and attended Mount Union College. He received his law degree from Ohio Northern University in 1902. Judge Floyd was appointed to the bench by Governor Myers Cooper in 1929 and retained that post until his death. He was elected an Associate of the Union in 1938.—T. S. PALMER.

MASAUJI, 18TH MARQUESS HACHISUKA, Ph.D., Sc.D., a Corresponding Fellow of the American Orithologists' Union since 1930, died of a heart ailment on May 14, 1953, at his home at Atami, Japan, at the age of 50.

He was born at Atami, Tokyo, on February 15, 1903. Following his education at Peers' School, Japan, he went to Europe at the age of nineteen to complete his training. Under the guidance of Baron Hayashi, the Japanese Ambassador in London and a friend of his father, then the Vice-President of the Japanese House of Peers, he pursued zoological studies at Cambridge University during the next five years. After graduating in 1927, he returned to Japan through America in company with the writer. The colorful welcome given to him by the aristocracy and officials of Japan, headed by his father and his uncle, Prince Tokugawa, the last Shogun, still remains vivid in my memory. We later traveled together to Korea and China. He conducted an expedition to the Philippines in 1928–29, and he soon returned to Europe where he stayed until 1934. He had previously traveled a good deal in Europe and North Africa. After a trip to the Belgian Congo with the late Jean-Marie Derscheid, he paid a lengthy visit to the King and Queen of Bulgaria.

During all these years, Hachisuka was one of our inner circle of European bird-friends. He attended meetings and conventions regularly in England, in France, and elsewhere. As he was traveling back to Japan through the United States, he fell seriously ill at Los Angeles and remained there four years, during which time he recovered completely. The writer spent several months with him in 1936–37 at Pasadena and never saw him again. In the course of these years in California, he made many close friends. He returned to Japan in October, 1937, and on March 7, 1939, married Chiye Negamine of Los Angeles.

The war period was difficult for him because of his western ways and friendships. After peace was restored, his wealth having greatly diminished, he lived quietly at Atami, where he had built a house of Moorish style to his own liking. He surrounded himself with birds, resumed his studies, and carried on an assiduous correspondence with his old friends in America and Europe. To them his unexpectedly early death was a great shock.

Hachisuka was a true lover of birds, live birds in freedom and captivity, as well as museum specimens. As an aviculturist, he kept and raised many species in Japan, particularly pheasants. He collected bird skins extensively in the Philippines and elsewhere, also acquiring private collections. Most of his early bird work was done at the museums at Tring and in London.

His publications are numerous. Besides many articles and notes in Avicultural Magazine, L'Oiseau, Ibis, Bulletin of the British Ornithologists' Club, Tori and other periodicals, he wrote books on the birds of Egypt, Iceland, the Phillippines, Hainan, and Formosa, and a treatise on bird variation. His splendid book on "The Dodo and Kindred Birds," just published, he did not live to see. He had been working recently on a book on the birds of China.

Marquess Hachisuka was unwillingly separated from his western friends during the last fifteen years of his life, but his colleagues retained him in vivid and affectionate rememberance.—JEAN DELACOUR.

FANNY CURTIS BARRI KIRKHAM (MRS. JAMES WILSON KIRKHAM), an Associate of the American Ornithologists' Union, died in Springfield, Massachusetts, November 1, 1928, at the age of 70. She was born in Cambridge, August 26, 1857, and was a gifted pianist. Her husband was a banker. In 1904 she was elected an Associate of the Union, but despite her interest in birds apparently published none of her observations.—T. S. PALMER.

HARRY LEON KUTZ, an Associate of the American Ornithologists' Union since 1938, died in Philadelphia, Pennsylvania, December 25, 1952. He was born in Harrisburg, Pa., January 1, 1901. His preliminary biological training was received at Syracuse University, this institution granting him an M.A. in 1931. He obtained his Ph.D. at Cornell University in 1940, his thesis being, 'The inhibiting influence of captivity upon reproduction in wild ducks. Effect of light and various gonadotropic hormones.' The following positions were held by him: Assistant Professor of Biology, Norwich University, 1931–36; Instructor in Game Management, Cornell University, 1938–40; Game Research Investigator, New York State Conservation Department, 1941–46; and Assistant Professor of Game Management, University of Maine, 1947–50. In 1950 he was made head of the Department of Biology, Norwich University, a position retained at the time of his death.

Mr. Kutz taught ornithology at the University of Maine and added a course on this subject to the curriculum of Norwich University. His name appears on nine ornithological papers printed between 1940 and 1949 in the Auk, Wilson Bulletin, Journal of Wildlife Management, and Journal of Parasitology. He is survived by his wife, Gertrude Anne, a son, and a daughter.—A. W. SCHORGER.

CLARENCE SACKETT of Rye, New York, an Associate of the American Ornithologists' Union, died May 15, 1923, at the age of 67. He was born in 1856 and served as vestryman and church warden of Christ's Episcopal Church in Rye, New York. He was elected an Associate of the Union in 1910, but apparently published nothing on birds.—T. S. PALMER.

JOHN WILLIS SCHELL, an Associate of the American Ornithologists' Union, died in Philadelphia, Pennsylvania, October 5, 1931, in his 69th year. He was born in Halifax, Pennsylvania, April 3, 1863, and was elected an Associate of the Union in 1923. During the period of his membership, apparently he published little if anything on birds.—T. S. PALMER.

CHARLES VETTER of Nyack, New York, an Associate of the American Ornithologists' Union, elected in 1898, died August 28, 1941. He was graduated from the New York College of Dentistry in 1896. For five years Doctor Vetter served as Professor of Dental Surgery at New York University and was also associated with the Guggenheim Clinic of New York. He was a member of research expeditions along the northern coast of Labrador and to the mountains of Guatemala.—T. S. PALMER.

Patrons, Fellows, Members, and Associates of the American Ornithologists' Union, October, 1953

Patrons

Carnes, Mrs. Herbert E., 25 Kenwood Road, Tenafly, New Jersey...(1944) 1952
Deane, Mrs. Ruthven, 830 Hibbard Rd., Winnetka, Illinois.....(1935) 1935
Lloyd, Hoyes, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ontario, Canada (1916)..... 1945
McIlhenny, Edward Avery (deceased)..... 1945
Merriam, Clinton Hart (Founder—deceased)..... 1937
Nichols, John Treadwell, American Museum of Natural History, Central Park West at 79th Street, New York 24, New York.....(1901) 1951
Stone, Mrs. Witmer (deceased)..... 1940
Stoner, Mrs. Dayton, 399 State St., Albany, New York.....(1944) 1946
Tucker, Mrs. Carll, 733 Park Avenue, New York, New York.....(1924) 1952
Wharton, William Pickman, Groton, Massachusetts.....(1907) 1945

Honorary Fellows

Bannerman, Dr. David Armitage, 120 Rivermead Court, Hurlingham, London, S. W. 6, England.....(1916) 1941
Berlioz, Prof. Jacques, Museum d'Histoire Naturelle, 55 Rue de Buffon, Paris, France.....(1923) 1938
Falla, Dr. Robert Alexander, Dominion Museum, Wellington, New Zealand.....(1937) 1949
Ghigi, Prof. Alessandro, Direttore del Laboratorio de Zoologia applicata alla Caccia, Via S. Giacomo, 9 Bologna, Italy.....(1921) 1949
Gyldenstolpe, Count Nils [Carl Gustaffersen], Naturhistoriska Riksmuseum, Stockholm 50, Sweden.....(1918) 1934
Haagner, Alwin Karl, P. O. Box 451, Pietermaritzburg, Natal, South Africa.....(1916) 1918
Kinnear, Sir Norman Boyd, British Museum (Natural History), Cromwell Rd., London, S. W. 7, England.....(1931) 1934
Kuroda, Dr. Nagamichi, Fukuyoshi Cho, Akasaka, Tokyo, Japan....(1918) 1921
Lack, Dr. David, Edward Grey Institute of Field Ornithology, Department of Zoological Field Studies, Botanic Garden, Oxford, England.....(1939) 1946
Lorenz, Prof. Konrad, Schloss Buldern über Dülmen, Westfalen, Germany.....(1938) 1951
Meinertzhagen, Col. Richard, 17 Kensington Park Gardens, London W. 11, England.....(1916) 1928
Moreau, R[eginald] E[rnest], The Yews, Berrick, near Benson, Oxon, England.....(1938) 1949
Palmgren, Prof. Pontus, Zoologiska Museet, N. Jarnvagsgatan 13, Helsingfors, Finland.....(1932) 1946
Pinto, Dr. Olivério Mário de Oliveira, Department of Zoology, Bureau of Agriculture, Industria e Comercio, São Paulo, Brazil, South America.....(1940) 1945
Stresemann, Prof. Erwin, Berlin-Charlottenburg, Wandalenallee 38, Germany.....(1922) 1930
Thomson, Sir A[rthur] Landsborough, 42 Girdwood Road, Southfields, London, S. W. 18, England.....(1922) 1951

CORRESPONDING FELLOWS

ALEXANDER, WILFRID BACKHOUSE, Edward Grey Institute, Department of Zoological Field Studies, Botanic Gardens, Oxford, England 1921
ALFARO, DON ANASTASIO, San José, Costa Rica 1888
ALI, SALIM A., 33 Pali Hill, Bandra, Bombay 20, India 1944
ARMSTRONG, E[DWARD] A[LLWORTHY], St. Mark's Vicarage, Barton Road, Cambridge, England 1951
BAXTER, MISS EVELYN VIDA, The Grove, Upper Largo, Fife, Scotland 1919
BEAUFORT, PROF. LIEVEN FERDINAND DE, De Hooge Kley, Amersfoort, Netherlands 1926
BELCHER, SIR CHARLES FREDERIC, South Kinangop, Kenya 1934
BERTONI, DR. ARNOLDO DE WINKELREID, Puerto Bertoni, Paraguay, South America 1919
BRYANT, CHARLES ERNEST WILLIAM, 394–396 Collins Street, Melbourne, Australia 1949
CHISHOLM, ALEXANDER HUGH, Angus & Robertson, Ltd., 89 Castlereagh St., Sydney, Australia 1922
DAVID-BEAULIEU, ANDRÉ, Chateau Coutet, Saint-Émillion (Gironde), France 1949
DE LAVALLE, JOSÉ ANTONIO, Lima, Perú 1925
DEMENTIEV, PROF. GEORGES, Zoological Museum, Moscow Government University, Moscow, 9, U. S. S. R. 1934
DOMANIEWSKI, PROF. JANUSZ WITOLD, Museum Tatrzanskie, Zakopane, Poland 1926
DROST, DR. RUDOLF, Mitscherlichstr. 54, (23) Wilhelmshaven, Germany 1934
DUGAND, ARMANDO, Universidad Nacional, Instituto de Ciencias Naturales, Apartada Postal No. 2535, Bogotá, Colombia 1952
ENGELBACH, DR. PIERRE, 10 rue Copernic, Paris XVI^{e}, France 1949
FISHER, JAMES [MAXWELL MCCONNELL], Old Rectory, Ashton, Northampton, England 1951
GIBSON-HILL, CARL ALEXANDER, Raffles Museum, Singapore, Malaya 1951
GOODALL, J[ACK] [WILLIAM] D[AVIES], Casilla 2238, Santiago, Chile 1952
GRANT, CLAUDE HENRY BAXTER, 8 Cornwall Gardens Court, 50 Cornwall Gardens, London, S. W. 7, England 1920
GROEBBELS, DR. FRANZ, Physiologischer Institut Krankenhaus, Hamburg, Eggendorf, Germany 1933
HAVERSCHMIDT, FRANÇOIS, P. O. Box 644, Paramaribo, Surinam, Dutch Guiana ..... (1928) 1950
HINDWOOD, DR. K. A., Wingello Place, Angel Place, Sydney, New South Wales 1938
HUXLEY, DR. JULIAN SORRELL, 31 Pond St., Hampstead, London, N. W. 3, England 1941
INGRAM, COLLINGWOOD, The Grange, Benenden, Cranbrook, Kent, England .. 1920
IREDALE, TOM, c/o Australian Museum, Sydney, New South Wales 1918
JOHNSON, ALFRED WILLIAM, Casilla 327, Santiago, Chile ..... (1950) 1952
JUNGE, DR. G. C. A., Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands 1939
KRAMER, DR. GUSTAV, Max Planck Institut für Meeresbiologie, (23) Wilhelmshaven, Germany 1951
LAUBMANN, DR. ALFRED, Karolingerstrasse 18/11, (13b) München 9, Bayern, U. S. Zone, Germany 1923

MacDonald, James David, British Museum (Natural History), Cromwell Road, London, S. W. 7, England 1949
Mayaud, Noël, 80 rue du Ranelagh, Paris XVI, France 1949
Meise, Dr. Wilhelm, Bornplatz 5, Hamburg 13, Germany 1938
Moltoni, Dr. Edgardo, Direttore del Museo Civico, Corso Venezia 55, Milano, Italy 1936
Momiyama, Toku Taro, 1146 Sasazka, Yoyohata-mati, Tokyo, Japan 1925
Nicéforo María, Hermano, Museo del Instituto de La Salle, Calle 11, No. 1.69, Bogotá, Colombia 1921
Oliver, Dr. Walter Reginald Brook, 26 Ventnor Street, Seatoun, Wellington, E. 5, New Zealand 1923
Philippi B., Rodulfo Amando, Tobalaba 157, Santiago, Chile ..... (1941) 1952
Poncy, Robert, Weber 15, Geneva, Switzerland 1932
Rensch, Dr. Bernhard, Zoologisches Institut der Westfälischen Landes-Universität, Bade-Str. 9, (21a) Münster (Westf.), Germany 1932
Richdale, Lancelot E[ric], 23 Skibo St., Kew, Dunedin, S. W. 1., New Zealand ..... (1943) 1947
Salomonsen, Dr. Finn, Zoologisk Museum, Krystalgade, Copenhagen K, Denmark 1949
Sassi, Dr. Moriz, Naturhist. Museum, Burgring 7, Vienna 1, Austria 1934
Schaanning, Hans Thomas Lange, Stavanger Museum, Stavanger, Norway .. 1923
Schouteden, Dr. H., Musée du Congo Belge, Tervuren, Belgium 1934
Schüz, Dr. Ernst, Paulinenstrasse 39, (14a) Ludwigsburg, Wuerttemberg, Germany 1938
Serventy, Dr. D[ominick] L., Wildlife Survey Section, C. S. I. R. O., 1 Museum Street, Perth, Western Australia 1949
Seth-Smith, David W[illiam], 11 Stanford Court, Cornwall Gardens, London, S. W. 7, England 1920
Skovgaard, Peter, Viborg, Denmark 1926
Stegmann, Dr. Boris Charles, Zoological Museum, Academy of Science, Leningrad, U. S. S. R. 1932
Stoneham, Lt. Col. Hugh Frederic, Stoneham Museum and Research Centre, Kitale, Kenya Colony, British East Africa ..... (1928) 1930
Takatsukasa, Prince Nobusuke, 87 Yoyogisanya, Shibuya-Ku, Tokyo, Japan 1924
Ticehurst, Norman Frederic, Spots House, Small Hythe, Tenterden, Kent, England 1918
Tinbergen, Dr. Niko, Department of Zoology, University Museum, Oxford, England 1938
Uchida, Dr. Seinosuke, No. 1, 7-chome, Aoyama, Kitamachi, Tokyo, Japan .. 1919
Van Someren, Dr. Victor Gurnet Logan, Box 658, Nairobi, Kenya Colony, British East Africa 1921
Vincent, Col. Jack, "Firle," P. O. Box 44, Mooi River, Natal, South Africa 1949
Wagner, Dr. Helmuth O., Übersee Museum, Bremen, Germany ..... (1945) 1950
White, Samuel Albert, Wetunga, Fulham, South Australia 1919
Yamashina, Dr. Yoshimaro, Yamashina Museum, 49 Nanpeidai-Machi, Shibuya-ku, Tokyo, Japan 1949

Fellows, Members, and Associates

Abbott, Jackson Miles, 814—13th St., New Alexandria, Virginia 1946
Abbott, Ruth Stewart, 166 Senneville Rd., Senneville, Port Quebec, Canada 1951

ABDULALI, HUMAYUN, Faiz & Co., 75 Abdul Rehman St., Bombay 3, India 1946
ABRAITYS, VINCENT [VALENT], Sergeantsville, New Jersey 1950
L ACHILLES, MRS. GERTRUDE S., Morgan Hill, California 1925
ADAMS, HERBERT GERALD, 730 S. W. St. Clair Ave., Portland 5, Oregon .. 1943
ADAMS, I. C. JR., Box 158, Columbia, Missouri 1939
ADAMS, IVERS S[HEPARD], Hardwick, Massachusetts 1938
ADAMS, LAURA [LOUISE] C., Andrews, South Carolina 1950
ADAMS, LOWELL, Forest Experiment Station, Missoula, Montana 1947
ADAMS, W[ILLIAM] R[ICHARD], Laboratory of Comparative Osteology, 707 Anita St., Bloomington, Indiana 1950
ADDY, C[HARLES] E[DWARD], 56 Spofford St., Newburyport, Massachusetts 1938
ADELSON, RICHARD, 34 Wensley Dr., Great Neck, Long Island, New York 1937
AGGEN, JOHN C., R. R. No. 1, Morrison, Illinois 1947
ALBRIGHT, LEROY, 1218 Bellefontaine St.—3, Indianapolis 2, Indiana 1953
ALBRIGHT, RAY, Route No. 1, Box 277, Dayton, Oregon 1952
ALCORN, ALBERT A., 105 E. Fairview St., Fallon, Nevada 1952
ALCORN, DR. GORDON D., College of Puget Sound, Tacoma 6, Washington 1952
F ALDRICH, DR. JOHN WARREN, Fish and Wildlife Service, Department of the Interior, Washington, D. C. ..... (1929) 1947
ALEXANDER, DONALD C[HILD], 16 Pleasant St., Nahant, Massachusetts .. 1936
ALEXANDER, DR. [EDWARD] GORDON, Department of Biology, University of Colorado, Boulder, Colorado 1919
ALEXANDER, ROBERT CROZER, 423 Worwick Road, Wynnewood, Pennsylvania 1953
ALEXANDER R[OBERT] C[AMPBELL], 19207 Charleston Ave., Detroit, Michigan 1942
ALLAN, ALEXANDER, 9225—96 St., Edmonton, Alberta, Canada 1949
ALLAN, PHILIP F[ARLEY], 1801 Carleton, Fort Worth, Texas 1931
ALLARD, H[ARRY] [ARDELL], 3000—7th St., North, Arlington, Virginia ... 1929
ALLEE, W[ARDER] C[LYDE], 114 Leigh Hall, University of Florida, Gainesville, Florida 1940
F ALLEN, DR. ARTHUR A[UGUSTUS], Fernow Hall, Cornell University, Ithaca, New York ..... (1909) 1922
ALLEN, FREDERICK W[ILLIAM] JR., c/o The Yankee Traveler, Route 3, Plymouth, Massachusetts 1951
M ALLEN, DR. ELSA G[UERDRUM], Cornell University, Ithaca, New York (1935) 1947
ALLEN, MISS ESTHER C[AMPBELL], Camarillo State Hospital, Camarillo, California 1949
F ALLEN, FRANCIS HENRY, 9 Francis Ave., Cambridge 38, Massachusetts (1888) 1947
M ALLEN, ROBERT PORTER, Tavernier, Florida ..... (1933) 1944
ALLEN, MISS SUSAN J[ANNEY], "Sunnybrae," Box 467, Milford, Delaware . 1949
ALLEN, WALTER FOX, 93 Maplewood Ave., Maplewood, New Jersey 1925
ALLIN, DR. ALBERT E[LLIS], Provincial Health Laboratory, Fort William, Ontario, Canada 1939
ALLIS, COMMANDER FREDERICK ASHTON, U. S. N., Naval Supply Annex, Stockton, California 1953
ALLISON, SIDNEY J[OB], 58 Alfreton Rd., Nottingham, England 1950
ALMON, DR. LOIS, Department of Bacteriology, North Dakota Agricultural College, Fargo, North Dakota 1948

ALPERIN, IRWIN M., 2845 Ocean Ave., Brooklyn 35, New York..... 1939
ALTEMUS, DONALD R[ICHARD], 120 Stewart St., Freeport, Pennsylvania.. 1949
ALTEMUS, EDWARD L[EE], 210 W. Highland Ave., Philadelphia 18, Pennsylvania..... 1952
ALTMANN, STUART ALLEN, 626½ N. Sweetzer, Los Angeles 48, California.. 1953
F AMADON, DR. DEAN, American Museum of Natural History, Central Park West at 79th St., New York 24, New York.....(1930) 1949
AMES, OAKES I[NGALLS], 7 Meadow Way, Cambridge 38, Massachusetts.. 1950
AMES, MISS ROSELLA S[PRAGUE], Moraine St., Marshfield, Massachusetts 1940
M ANDERSON, ANDERS HAROLD, 3221 Kleindale Road, Tucson, Arizona (1939) 1950
ANDERSON, MRS. ARVID, 3518 Dawes St., Madison 4, Wisconsin..... 1949
ANDERSON, EARL A[XEL], 7335 N. Odell Ave., Chicago 31, Illinois..... 1950
ANDERSON, FRANK C., Beech and Woodland Ave., Louisville 11, Kentucky..... 1948
ANDERSON, DR. FRANK G., Department of Sociology, University of Maryland, College Park, Maryland..... 1951
ANDERSON, G[EORGE] ARTHUR, 601 E. Wapello St., Altadena, California. 1949
ANDERSON, DR. GEORGE EDWIN, 408 Shearer Building, Bay City, Michigan 1939
ANDERSON, JOHN M., Winous Point Club, Port Clinton, Ohio..... 1938
M ANDERSON, RUDOLPH M[ARTIN], 58 Driveway, Ottawa, Ontario, Canada (1907) 1914
ANDERSON, W. D., 3100 Beverly Rd., Austin 3, Texas..... 1952
ANDREWS, ARTHUR ALLEN, 75 Penfield Crescent, Brighton Station, Rochester 10, New York..... 1924
ANDREWS, G[EORGE] MALCOLM, Oak Ridge Drive, R. D. No. 3, Schenectady New York..... 1943
ANDREWS, DR. JAMES M., 4150 Linnaean Ave., N. W., Washington 8, D. C. 1943
ANDREWS, MRS. LYDIA G[OEHMANN], Ipswich River Wildlife Sanctuary, Topsfield, Massachusetts..... 1949
ANDREWS, SARA BACHE [MRS. CHARLES B.], 20 Main St., Clinton, New Jersey..... 1947
ANGELL, LEROY E., Route 3, Box 302, Cloquet, Minnesota..... 1952
ANGELO, ANGELO D., 809 Palisade Ave., Union City, New Jersey..... 1946
ANGLIN, JAMES P., 957 Dunsmuir Rd., Town of Mount Royal, Quebec, Canada..... 1943
ANNAN, ORMSBY, 1059 Chatfield Rd., Winnetka, Illinois..... 1950
ANTEVS, MRS. ADA, The Corral, Globe, Arizona..... 1947
ANTHES, CLARENCE A[LVIN], 707 N. Moreland Blvd., Waukesha, Wisconsin 1937
ANTHONY, HOWARD E[DWARD], c/o Heath Company, Benton Harbor, Michigan..... 1949
ANTONIAZZI, JOHN F[RANCIS], Bayberry Lane, Westport, Connecticut.... 1950
APFELD, ALBERT L., South Green St., Tuckerton, New Jersey..... 1953
APPEL, THOMAS G., 63 Sunnyside Ave., Pleasantville, New York..... 1931
APPLEBERRY, MRS. EDNA LANIER, 5 Lake Forest Parkway, Wilmington, North Carolina..... 1947
APPLEGATE, WILSON G. HUNT, Rhinebeck, New York..... 1934
ARBIB, ROBERT S[IMEON], JR., 231 W. Lena Ave., Freeport, New York.... 1947
ARCHBOLD, RICHARD, American Museum of Natural History, 79th St. and Central Park West, New York 24, New York..... 1930
ARDAPPLE, MRS. CLARENCE [MARY JANE], R. R. No. 1, Morrison, Illinois. 1949

AREND, PHILIP H[ANFORD], 10 Parrott St., Vallejo, California 1952
ARGUE, ARTHUR W., 1040 Boylston St., Boston, Massachusetts 1946
ARMITAGE, KENNETH B[ARCLAY], Birge Hall, Madison 6, Wisconsin 1952
ARMITT, H[ERBERT] T[HOMAS], 184 Kinderkamack Rd., Oradell, New Jersey 1950
ARMSTRONG, JOSEPH THEXTON, JR., 306 South 49th Ave., Omaha 3, Nebraska 1953
ARMSTRONG, MISS VIRGINIA, Musketaquid Rd., Concord Massachusetts .. 1937
ARNETT, DR. JOHN HANCOCK, JR., 6200 Ardleigh St., Germantown, Philadelphia 38, Pennsylvania 1946
L ARNOLD, EDWARD WILLIAM CAMERON, Cedar Swamp Road, Glen Head, New York 1929
ARNOLD, ELTING, 4914 Dorset Ave., Chevy Chase 15, Maryland 1934
ARNOLD, LEE W[EIGHT], P. O. Box 53, Cedarville, California 1949
ARNY, SAMUEL A[NDREW], Apartment 2, 6515 Willston Drive, Falls Church, Virginia 1952
ARVEY, DR. M[ARTIN] DALE, Department of Biology, Long Beach State College, Long Beach 4, California 1949
ASHTON, RANDOLPH, 800 Crown St., Morrisville, Pennsylvania 1938
ATKESON, THOMAS Z[EPHANIAH], JR., 1217 9th Ave. East, Decatur, Alabama 1951
ATKINS, DR. ELISHA, 538 Warder Ave., University City 24, Missouri 1946
ATSATT, DR. SARAH R., 405 Hilgard Ave., Los Angeles 24, California 1947
ATWOOD, EARL L[EROY], 7117 Woodland Ave., Takoma Park, Maryland .. 1948
AUCHINCLOSS, BAYARD C[UTTING], 1711 Guilford Lane, Oklahoma City, Oklahoma 1949
AUSTIN, CYRUS, 200 East 66th St., New York 21, New York 1952
AUSTIN, MRS. ENID K., 1116 Mandana Blvd., Oakland 10, California 1947
AUSTIN, JOHN BRANDER, 2326 Camp St., New Orleans 13, Louisiana 1947
F AUSTIN, DR. OLIVER LUTHER, JR., ADTIC, Research Studies Institute, Maxwell Air Force Base, Alabama ..... (1925) 1948
M AUSTIN, DR. OLIVER LUTHER, SR., Tuckahoe, Westchester County, New York ..... (1930) 1940
AVERY, MRS. HELEN G[OULD], 160 Wellington St., Springfield, Massachusetts 1948
M AXTELL, DR. HAROLD H[AMILTON], Buffalo Museum of Science, Buffalo 11, New York ..... (1941) 1951
AYER, MRS. N[ATHAN] EDWARD, 1300 Hillcrest Drive, Pomona, California . 1924
BABCOCK, CHARLES D., 36th St. and Woodland Ave., Reading, Pennsylvania 1953
BABCOCK, FRED I[RVING], Land O'Lakes, Wisconsin 1951
BACON, BRASHER COLLINS, SR., Spring Lake Wildlife Refuge, Madisonville, Kentucky 1948
BACON, FRANCIS L[LEWELLYN], 22 Waterman Ave., Philadelphia 18, Pennsylvania 1917
BAER, MYRTLE W., 1237 North Jefferson St., Milwaukee, Wisconsin 1942
M BAERG, DR. WILLIAM J., College of Agriculture, University of Arkansas, Fayetteville, Arkansas ..... (1924) 1952
LM BAGG, AARON MOORE, 72 Fairfield Ave., Holyoke, Massachusetts ... (1946) 1951
F BAILEY, ALFRED M[ARSHALL], Colorado Museum of Natural History, Denver, Colorado ..... (1918) 1941

L BAILEY, JOHN WENDELL, 27 Willway Rd., Richmond 21, Virginia 1925
BAILEY, DR. ROBERT E[LWYN], Division of Anatomy, University of Tennessee, Memphis, Tennessee 1951
M BAILLIE, JAMES L[ITTLE], JR., Royal Ontario Museum of Zoology, 100 Queen's Park Dr., Toronto, Ontario, Canada ..... (1923) 1935
BAILY, FISHER C., 1229 Ralston St., Reno, Nevada 1947
BAIRD, JAMES, 81 Payson Lane, University Heights, New Brunswick, New Jersey 1947
BAKER, B[ERNARD] W., R. R. No. 1, Judson Rd., Spring Lake, Michigan .. 1938
M BAKER, JOHN HOPKINSON, 1165—5th Ave., New York 28, New York (1911) 1949
L BAKER, MISS MILDRED E., 275 Hillcrest Dr., Route 1, Encinitas, California 1947
BAKER, PAUL S., Box 511, Huntington, Long Island, New York 1944
M BAKER, DR. ROLLIN HAROLD, Museum of Natural History, University of Kansas, Lawrence, Kansas ..... (1939) 1950
BAKER, WILLIAM CALVIN, 559 Euclid St., Salem, Ohio 1930
BALDWIN, MRS. HARRY LEVERETT, 6335 Kimbark Ave., Chicago 37, Illinois 1924
BALDWIN, MRS. HELEN SHIRAS, 326-C Waianuenue Ave., Hilo, Hawaii .. 1952
BALDWIN, DR. PAUL H., Department of Zoology, Colorado A. and M. College, Fort Collins, Colorado 1947
BALDWIN, DR. WILLIAM GROVE, Box 665, Quincy, Washington 1953
BALDWIN, WILLIAM P[LEWS], JR., c/o Savannah Natural Wildlife Refuge, Port Wentworth, Georgia 1937
BALL, MISS A. ELIZABETH, 28 East St., Rutland, Vermont 1947
BALL, DR. KATHLEEN E., Department of Entomology, Comstock Hall, Cornell University, Ithaca, New York 1946
BALL, ROBERT E[DWIN], 1226 Woodland Avenue, Northwest, Canton 3, Ohio 1938
BALL, STANLEY C[RITTENDEN], Peabody Museum of Natural History, New Haven, Connecticut 1942
BALLANCE, LEON G., Lake Landing, North Carolina 1952
BALSOM, MRS. AMOS P., 2209 E. Stratford Court, Milwaukee 11, Wisconsin 1947
BARBER, D[AVID] H[ENRY], The Rectory, Mells, near Frome, Somerset, England 1948
BARBER, HERB[ERT] K[NEESHAW], 22 North 4th St., Niles, Michigan 1953
BARBOUR, DR. ROGER W., Department of Zoology, University of Kentucky, Lexington, Kentucky 1937
BARKALOW, FREDERICK S[CHENCK], JR., Box 5215, State College Station, Raleigh, North Carolina 1938
BARNARD, ELLSWORTH, 1236 East 46th St., Chicago 15, Illinois 1949
BARNES, CHARLES K[NAPP], 5006 S. Michigan Rd., South Bend, Indiana .. 1946
HL BARNES, CLAUDE TEANCUM, 359 Tenth Ave., Salt Lake City, Utah 1908
BARNES, FRED R[USSELL], 4282 Maple Avenue, Oakland 2, California 1953
BARNES, MRS. RUTH, 173 Myrtle St., Shelton, Connecticut 1944
BARNES, WILLIAM B., Indiana Department of Conservation, 311 West Washington St., Indianapolis 9, Indiana 1947
BARRACLOUGH, MARY EDITH, Mont. Coop. Wildlife Research Unit, Montana State University, Missoula, Montana 1953
BARRETT, CHARLES H[ORATIO] M[ATCHETT], 1339 Valley Place, S. E., Washington, D. C. 1912

BARRETT, VERNON, 1300 Chelten Way, South Pasadena, California..... 1953
BARRY, EDWIN MCCORMICK, Epping Forest, Rural Route No. 1, Annapolis, Maryland..... 1942
BARRY, MISS ELEANOR E[LIZABETH], 91 Hillside Ave., Melrose 76, Massachusetts..... 1951
BARTEL, KARL E[MIL] [EDGAR], 2528 W. Collins St., Blue Island, Illinois.. 1934
M BARTHOLOMEW, DR. GEORGE A[DELBERT], JR., Department of Zoology, University of California, Los Angeles 24, California .....(1941) 1949
BARTL, ROBERT LA SALLE, 1309 Gallatin St., N. W., Washington 11, D. C. 1947
BARTLESON, FRED D., JR., University of Florida, Department of Biology, Gainesville, Florida..... 1952
BARTLETT, CHARLES O[MAR], Box 791, Aylmer, Ontario, Canada..... 1953
BARTLETT, GUY, 1053 Parkwood Blvd., Schenectady 8, New York..... 1932
BARTLETT, DR. L[AWRENCE] M[ATTHEWS], Zoology Department, University of Massachusetts, Amherst, Massachusetts..... 1952
BARTON, ROGER AVERY, 22 Arlington Ave., Caldwell, New Jersey..... 1952
BARTRAM, EDWIN B[UNTING], Bushkill, Pike Co., Pennsylvania..... 1913
M BARTSCH, DR. PAUL, Lebanon, Gunston Hall Rd., Norton, Virginia .(1896) 1902
BASKETT, DR. THOMAS S[EBREE], Missouri Coop. Wildlife Research Unit, Wildlife Conservation Building, University of Missouri, Columbia, Missouri..... 1946
BASNER, HARRY, Mountaindale, New York..... 1927
BASTIN, ERIC W[ALTER], 43 Inglewood Drive, Apartment 2, Hamilton, Ontario, Canada..... 1951
F BATCHELDER, CHARLES FOSTER, 7 Kirkland St., Cambridge, Mass.....Founder
BATCHELDER, MRS. CHARLES F[OSTER], [LAURA P.], 7 Kirkland St., Cambridge, Massachusetts..... 1930
BATES, CURTIS E., 609 Elm St., Rome, New York..... 1946
BATES, CYRIL D., Box 600, Dauphin, Manitoba, Canada 1953
L BATTS, H[ENRY] LEWIS, JR., 1211 Glenwood Avenue, Kalamazoo, Michigan 1948
BAUGH, BIRDIE MAY, Birdland Farm, Belona, Virginia..... 1947
BAUGHN, WILLIAM H., 3113 East Lake Shore Dr., Baton Rouge, Louisiana. 1952
BAUMEL, JULIAN J., Anatomy Department, School of Medicine, Creighton University, Omaha, Nebraska..... 1951
BAUMGARTEN, DR. HENRY E[RNEST], Avery Laboratory, University of Nebraska, Lincoln 8, Nebraska..... 1953
BAUMGARTNER, DR. FREDERICK M[ILTON], Department of Zoology, A. and M. College, Stillwater, Oklahoma..... 1930
M BAUMGARTNER, DR. MARGUERITE HEYDWEILLER, [MRS. FREDERICK M.], R. R. No. 2, Stillwater, Oklahoma.....(1930) 1945
BAXTER, WILLIAM, Middletown, R. R. No. 2, Delaware..... 1950
BAYLESS, MRS. ANNE D[OUGLAS], 8925 Indian Boundary, Gary, Indiana. 1950
BAYNARD, OSCAR E., P. O. Box 124, Plant City, Florida..... 1944
BAYSINGER, DR. VERLIN G., 310 Barbara Rd., Pekin, Illinois..... 1952
BEACHAM, [EDWARD] DEREK, 238 Wineva Ave., Toronto 8, Ontario, Canada 1948
BEADEL, HENRY LUDLOW, R. R. 1, Tallahassee, Florida..... 1926
BEALS, EDWARD [WESLEY], Earlham College, Richmond, Indiana..... 1950
BEARD, MRS. T. C. [DOROTHY], R. R. No. 3, Box 152 A, Mound, Minnesota 1946
BEARDSLEE, CLARK SMITH, 132 McKinley Ave., Kenmore, New York.... 1930
BEASLEY, RAY J[ACKSON], P. O. Box 117, Newport News, Virginia..... 1947

BEATTIE, J[OHN] I[NNES], 24 Chauncy St., Cambridge 38, Massachusetts.. 1951
BECK, HERBERT H[UEBNER], 515 N. President Ave., Lancaster, Pennsylvania..... 1931
BECKER, MISS EDNA, 77 Oxford St., Apt. A-10, Hartford 5, Connecticut.. 1947
BEDDALL, EDWARD A., 312 Noroton Ave., Noroton Heights, Connecticut.. 1953
L BEDELL, LAUREL MAY [MRS. HARRY M.], 1620 Massachusetts Ave., N. W., Washington 6, D. C..... 1929
F BEEBE, DR. [CHARLES] WILLIAM, Zoological Park, New York 60, New York (1897) 1912
M BEECHER, WILLIAM JOHN, Chicago Natural History Museum, Roosevelt Road and Field Drive, Chicago 5, Illinois.....(1937) 1950
BEER, JAMES R[OBERT], Division of Entomology and Economic Zoology, University of Minnesota, St. Paul 1, Minnesota..... 1939
F BEHLE, DR. WILLIAM HARROUN, Department of Biology, University of Utah, Salt Lake City, Utah.....(1934) 1951
BEIDLEMAN, RICHARD G[OOCH], Zoology Department, Colorado A. and M. College, Fort Collins, Colorado..... 1948
BELCHER, PAUL E[UGENE], 988 Jefferson Ave., Akron, Ohio..... 1937
BELDING, JOHN C[LINTON], 63 Washington Ave., Northampton, Massachusetts..... 1949
L BELKNAP, JOHN BALCOM, 92 Clinton St., Gouverneur, New York..... 1927
M BELLROSE, DR. FRANK, JR., 334 E. Adams St., Havana, Illinois.....(1934) 1947
L BELT, CHARLES B[ANKA], 233 Broadway, New York 7, New York..... 1950
BELTON, WILLIAM, 9009 Kensington Parkway, Chevy Chase 15, Maryland 1947
BENCHLEY, MRS. BELLE J[ENNINGS], Box 551, Zoological Society of San Diego, San Diego 12, California..... 1950
BENCKENSTEIN, MRS. EUNICE R[OBINSON], P. O. Box 720, Orange, Texas.. 1949
BENJAMIN, GILBERT G., JR., Apartment 102, 2107 Hildarose Dr., Silver Spring, Maryland..... 1947
BENNETT, CHA[RLE]S H[ERBERT], 80 Belmont Ave., Ottawa, Ontario, Canada 1948
BENNETT, HAROLD EBENEZER, 1515 Burton St., Rockford, Illinois..... 1947
BENNETT, HENRY P[ORTER], National Audubon Society, 13 McAllister Arcade, Miami, Florida..... 1953
BENNETT, HOLLY R[EED], Hornblower and Weeks, 134 S. LaSalle St., Chicago 3, Illinois..... 1952
BENNETT, JOSEPH A[LEXANDER], JR., 28 Berkeley Rd., Maplewood, New Jersey..... 1951
M BENNETT, DR. LOGAN JOHNSON, Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.....(1934) 1946
BENNETT, WALTER WALDO, Arnolds Park, Iowa..... 1924
BENSON, DR. SETH B[ERTRAM], 645 Coventry Rd., Berkeley 7, California.. 1928
LF BENT, ARTHUR CLEVELAND, 140 High St., Taunton, Massachusetts.(1909) 1920
BENT, GEORGE PAYNE, II, Lake Ave., Greenwich, Connecticut..... 1950
BENTON, ALLEN H[AYDON], New York College for Teachers, Albany, New York..... 1949
M BERGER, DR. ANDREW J[OHN], Department of Anatomy, East Medical Building, University of Michigan, Ann Arbor, Michigan....(1948) 1952
BERGMANN, WILLIAM E[DMUND], JR., 6719 Betts Ave., North College Hill 24, Ohio..... 1950
L BERGSTROM, E[DWARD] ALEXANDER, 37 Old Brook Rd., W. Hartford 7, Connecticut..... 1939

BERKEY, GLEN L[EROY], 22 S. State St., Rittman, Ohio 1949
BERKOWITZ, ALBERT C[LARENCE], 517—58th St., Des Moines 14, Iowa 1948
BERRY, SYDNEY G[RISWOLD], 53 Gordonhurst Ave., Upper Montclair, New Jersey 1951
BESSON, E[SAIE] JOHN, 1839 Ingleside Terr., N. W., Washington 10, D. C.. 1947
BESTON, HENRY, Chimney Farm, Nobleboro, Maine 1950
BIAGGI, DR. VIRGILIO, JR., Biology Department, University of Puerto Rico, College of Agriculture and Mechanic Arts, Mayaguez, Puerto Rico. 1944
L BIGELOW, MRS. ARCHIBALD PIERCE, 270 Wayne Ave., Oakland, California 1919
HL BIGELOW, HOMER LANE, The Farm, Windy Row, Peterborough, New Hampshire 1902
BIGGS, JOSEPH D[ANIEL], 6624 First St., N. E., Washington 12, D. C..... 1949
BINGHAM, MRS. HARRY P., JR., [LILLA FISK], Cove Road, Oyster Bay, Long Island, New York 1949
BINGHAM, MILLICENT TODD, 1661 Crescent Pl., Washington 9, D. C..... 1949
BINNEY, DR. HORACE, 65 Green St., Milton 86, Massachusetts 1951
BIRDSALL, CARL A., 190 E. Pearson St., Chicago 11, Illinois 1953
BIRDSEYE, CLARENCE, Eastern Point Blvd., Gloucester, Massachusetts 1948
BIRKELAND, HENRY, Roland, Iowa 1933
BISWAS, BISWAMOY, Zoological Survey of India, Indian Museum, 27 Chowringhee, Calcutta 13, India 1948
BLACK, DR. C[HARLES] THEODORE, R. R. No. 1, Box 480, East Lansing, Michigan 1933
HL BLACKWELDER, ELIOT, P. O. Box N, Stanford, California 1895
L BLAIN, DR. ALEXANDER WILLIAM, 1028 Berkshire Rd., Grosse Pointe Park 30, Michigan 1902
M BLAKE, DR. CHARLES HENRY, Lincoln, Massachusetts .....(1946) 1950
F BLAKE, EMMET REID, Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois .....(1933) 1952
BLAKE, DR. SIDNEY FAY, 3416 North Glebe Rd., Arlington, Virginia..... 1923
BLANCHARD, HAROLD H[OOPER], 32 Calumet Road, Winchester, Massachusetts 1939
BLAND, JOHN BROWNELL, 106 Avenue Camilo, Coral Gables 34, Florida 1948
BLANKENSHIP, LYTLE H[OUSTON], Department of Fisheries and Wildlife, Michigan State College, East Lansing, Michigan 1949
L BLAUVELT, HIRAM B. D., 637 Kinderkamack Rd., Oradell, New Jersey... 1948
L BLEITZ, DONALD L., 5338 Hollywood Blvd., Hollywood, California..... 1947
BLIESE, JOHN C[ARL] W[ILLIAM], Biology Dept., Nebraska State Teachers College, Kearney, Nebraska 1951
BLINCOE, BENEDICT JOSEPH, 8766 N. Main St., Dayton 5, Ohio..... 1921
BLOCK, MELVIN L[EON], 435 E. Hudson St., Toledo 8, Ohio 1950
BLOSSOM, PHILIP M[OSS], 10969 Rochester Ave., Westwood Hills, Los Angeles 24, California 1948
BLOUCH, RALPH I[RVING], 532 LaSalle Blvd., Lansing, Michigan..... 1949
BOCK, WALTER, 7630—85 Drive, Woodhaven 21, New York..... 1952
BODMER, OLIVE A. [MRS. HERBERT A.], Kenmare, North Dakota..... 1952
BOHL, WAYNE HEROLD, P. O. Box 991, Bellingham, Washington..... 1953
BOHN, HERMAN L[OUIS], 33–29 171 St., Flushing 58, New York..... 1952
BOLDTMANN, JOHN KARL, 132 Lincoln St., Hackensack, New Jersey..... 1949
BOND, HENRIETTA I. W. [MRS. FRANK], 3127 Newark St., N. W., Washington 8, D. C..... 1940

F BOND, JAMES, Academy of Natural Sciences, 19th and Race Sts., Philadelphia, Pennsylvania.....(1923) 1946
M BOND, RICHARD M[ARSHALL], Virgin Islands Corporation, Christiansted, St. Croix, United States Virgin Islands.....(1939) 1945
L BOND, RICHARD R[ANDOLPH], Department of Zoology, University of Wisconsin, Madison 6, Wisconsin..... 1952
BONNEY, CHRISTINE A., [MRS. GUY E.], 518 E. Monroe St., c/o Security Federal Savings & Loan Association, Springfield, Illinois..... 1949
BOOCOCK, PHILIP M. B., 53 Colvin Ave., Buffalo 16, New York..... 1946
BOOTH, DR. ERNEST S[HELDON], Department of Biology, Walla Walla College, College Place, Washington..... 1946
BOOTH, MRS. ROBERT V. D., 1085 Bank St., Painesville, Ohio..... 1951
BORDEN, RICHARD, Great Meadows Road, Concord, Massachusetts..... 1947
BORDNER, MISS DOROTHY LOUISE, 926 W. Beaver Ave., State College, Pennsylvania..... 1953
BORELL, A[DREY] E[DWIN], Soil Conservation Service, Albuquerque, New Mexico..... 1927
BORROR, DR. DONALD J[OYCE], Department of Zoology and Entomology, Ohio State University, Columbus, Ohio..... 1936
BORST, GEORGE H., Rittenhouse Claridge, 18th and Walnut Sts., Philadelphia 3, Pennsylvania..... 1952
BOSSENMAIER, EUGENE F., 299 Oneida St., St. Paul 2, Minnesota..... 1952
BOTSFORD, MISS E. FRANCES, Connecticut College, New London, Connecticut..... 1947
BOUCHER, DR. DUNCAN WILSON, 102 Wellington St., Kingston, Ontario, Canada..... 1953
M BOULTON, [WOLFRID] RUDYERD, JR., 3234 Reservoir Rd., Northwest, Washington 7, D. C.....(1915) 1929
BOURNE, RAYMOND D[ORY], Box 109, Oxford, Ohio..... 1946
BOURNE, WILLIAM N[ETTLETON], JR., 34 Buckingham St., Cambridge 38, Massachusetts..... 1952
BOUSLOG, DR. JOHN S[AMUEL], 304 Republic Building, Denver 2, Colorado. 1930
L BOVEY, MARTIN K., Chelmsford, Massachusetts..... 1942
M BOWDISH B[EECHER] S[COVILLE], Demarest, New Jersey.....(1891) 1934
HL BOWDISH, MRS. B[EECHER] S., [CHRISTABEL EVERETT], Demarest, New Jersey..... 1902
BOWEN, RICHARD, 703 Pearse Rd., Swansea, Massachusetts..... 1947
BOWEN, ROBERT M[ARVIN], 5009 Leeds Ave., Halethorpe 27, Maryland.. 1947
BOWERS, DARL EUGENE, Museum of Vertebrate Zoology, Berkeley 4, California..... 1953
BOWERS, GLENN L[EE], 28 Stewart Place, Box 222, Shippensburg, Pennsylvania..... 1951
L BOWERS, JIM M., 595 N. 15th St., Salem, Oregon..... 1953
BOWMAN, CHARLES EDWARD, JR., 20 W. Orange St., Lititz, Pennsylvania.. 1947
BOYD, DR. ELIZABETH M[ARGARET], Zoology Department, Mount Holyoke College, South Hadley, Massachusetts..... 1948
BOYD, HUGH J[AMES], The New Grounds, Slimbridge, Gloucester, England 1949
BOYD, THOMAS HUTCHESON, 64 Edgewood Ave., Clifton, New Jersey..... 1953
BOYER, G[EORGE] F[REDERICK], R. R. No. 1, West Sackville, New Brunswick, Canada..... 1946

M BRACKBILL, HERVEY [GROFF], 4608 Springdale Ave., Baltimore 7, Maryland.....(1940) 1949
BRADBURN, DR. DONALD MUIR, 461 Pine St., New Orleans, Louisiana.... 1949
BRADLEY, MISS ANNA PENFIELD, 352 Whitney Ave., New Haven, Connecticut..... 1933
BRADLEY, LEONARD J[OSEPH], Horseshoe Rd., Wilton, Connecticut..... 1946
BRAINERD, JOHN W., 67 Parkside St., Longmeadow, Massachusetts..... 1938
BRAMAN, MYRTLE, 206 W. Stayton Ave., Victoria, Texas..... 1951
L BRAND, MRS. ALBERT R[ICH], 50 W. 72nd St., New York 23, New York.... 1934
LM BRANDT, HERBERT WILLIAM, 2425 North Park Blvd., Cleveland 6, Ohio (1915) 1947
BRANSON, W[ILLIAM] D[ONALD], 53 Colborne St., Toronto, Ontario, Canada 1952
BRAUNBERNS, JAMES E[DWARD], Eighteen Mile Creek Rd., Derby, New York..... 1949
BRAUNER, JOSEPH, 11233 Van Buren Ave., Los Angeles 44, California.... 1933
BRECHER, LEONARD C[HARLES], 1900 Spring Drive, Louisville 5, Kentucky 1946
F BRECKENRIDGE, DR. WALTER JOHN, Museum of Natural History, University of Minnesota, Minneapolis, Minnesota.....(1926) 1950
BREIDING, GEORGE H[ERBERT], Oglebay Park, Wheeling, West Virginia.. 1944
BRIGGS, MARJORIE ANN, Department of Biology, University of Florida, Gainesville, Florida..... 1953
BRIGGS, S[TEPHEN] F[OSTER], Gordon Dr., Naples, Florida..... 1951
BRIGHAM, EDWARD MORRIS, JR., Kingman Museum of Natural History, Battle Creek, Michigan..... 1942
BRIGHAM, H[ERBERT] STORRS, JR., R. F. D., Fremont, New Hampshire.. 1946
BRINCKERHOFF, REMSEN, 156 Sherwood Pl., Englewood, New Jersey.... 1947
BRISTOW, MISS ALICE A[NDREWS], Silvermine Rd., Norwalk, Connecticut 1949
BRISTOW, HARRY S[HERMAN], JR., 210 Washington Ave., Cedars, Wilmington, Delaware..... 1940
BRITTAN, MARTIN RALPH, Department of Biology, Sacramento State College, Sacramento, California..... 1947
BROADBOOKS, DR. HAROLD E[UGENE], Box 345, Newport, Oregon..... 1948
BROCK, JEAN A. M., 9752 Old Warson Rd., St. Louis 17, Missouri..... 1946
BROCKE, RAINER H[ANS], Snyder Hall, Michigan State College, East Lansing, Michigan..... 1952
BROCKNER, WINSTON WILLIAM, 63 Ardmore Place, Buffalo 13, New York. 1952
BRODEY, ROBERT STANLEY, 323 Rushton Rd., Toronto, Ontario, Canada.. 1952
M BRODKORB, DR. [WILLIAM] PIERCE, Department of Biology, University of Florida, Gainesville, Florida.....(1925) 1937
BRODRICK, HAROLD J[AMES], Petrified Forest, Holbrook, Arizona..... 1935
BRODY, DR. GERALD L[EE], 12700 Shaker Blvd., Cleveland, Ohio..... 1951
M BROLEY, CHARLES LAVELLE, Delta, Ontario, Canada.....(1926) 1949
BROOKFIELD, CHARLES M[ANN], Box 284, Coconut Grove, Miami 33, Florida..... 1951
BROOKS, MRS. CHESTER L., Theodore Roosevelt National Park, Medora, North Dakota..... 1953
F BROOKS, MAURICE GRAHAM, Division of Forestry, West Virginia University, Morgantown, West Virginia.....(1930) 1950
M BROOKS, WINTHROP SPRAGUE, Kings Highway, Orleans, Massachusetts (1907) 1917

BROOMAN, EDWIN WILLIAM, 590 River St., East, Prince Albert, Saskatchewan, Canada 1943
BROOMAN, R[ONALD] C[HARLES], c/o Bank of Montreal, Kitchener, Ontario, Canada 1931
M BROUN, MAURICE, Hawk Mountain Sanctuary, R. D. No. 2, Kempton, Pennsylvania ..... (1922) 1948
BROWER, DR. AUBURN E[DMOND], 5 Hospital St., Augusta, Maine 1951
BROWN, CLARENCE D[UVALL], 222 Valley Rd., Montclair, New Jersey 1937
BROWN, JERRAM L[EFEVRE], 19 Hitchcock Rd., Amherst, Massachusetts .. 1949
BROWN, J[OHN] WARNER, Oatka Farm, Scottsville, New York 1951
BROWN, MORTIMER F[AYETTE], Overlook Rd., Westport, Connecticut 1951
BROWN, N[ORMAN] RAE, Faculty of Forestry, University of New Brunswick, Fredericton, New Brunswick 1946
BROWN, WENDELL, 5224 Blake Rd., Minneapolis, Minnesota 1949
BROWN, W. L., 173 Hillhurst Blvd., Toronto, Ontario, Canada 1953
BROWN, WILLIAM E[DMOND], 333 Harmon Ave., Northwest, Warren, Ohio 1949
BROWN, WILLIAM JAMES, 4129 Dorchester St., West, Westmount, Quebec, Canada 1908
BROWN, WOODWARD H[ART], 4815 Ingersoll Ave., Des Moines 12, Iowa .. 1950
BROWNE, ANDREW C., U. S. S. T. E. Chandler (DD 717), c/o Fleet Post Office, San Francisco, California 1952
BRUESTLE, BERTRAM G[EORGE], Old Lyme, Connecticut 1929
BRUMBAUGH, CHALMERS SHERFEY, 317 St. Dunstan's Rd., Homeland, Baltimore, Maryland 1916
BRUNS, JAMES HENRY, St. Francisville, Louisiana 1942
L BRUTON, J[AMES] D[EWITT], JR., P. O. Box No. 33, Plant City, Florida 1949
BRYANT, FREDERICK C[OPELAND], JR., 16 Wood End Lane, Bronxville, New York 1947
M BRYANT, DR. HAROLD CHILD, Grand Canyon, Arizona ..... (1913) 1918
BRYENS, OSCAR MCKINLEY, 231 S. Main St., Three Rivers, Michigan 1924
BUCHANAN, CHARLES M[CCAY], 104 W. Melrose Ave., Baltimore 10, Maryland 1949
BUCHANAN, FOREST W[ENDALL], Amsterdam, Ohio 1944
BUCHHEISTER, CARL W[ILLIAM], 1239 Madison Ave., New York 28, New York 1939
BUCKALEW, JOHN H[ERBERT], P. O. Box No. 55, Auburn, New York 1948
BUCKLAND, GEORGE [HENRY EDWARD], Route No. 1, Batavia, New York .. 1948
BUCKNELL, DONALD [NEEDHAM], 134 Wonham St., Ingersoll, Ontario, Canada 1949
BULL, JOHN L., JR., 49 Merrall Rd., Far Rockaway, New York 1947
BULLARD, D. BRUCE, 841½—14th Ave. S., St. Cloud, Minnesota 1949
BULLARD, WINSTON M., Guilford, Connecticut 1950
BULLOCK, DILLMAN SAMUEL, Casilla 2D, Angol, Chile 1920
BUNDICK, MISS HARRIET E[LLEN], 1465 Columbia Rd., N. W., Washington 9, D. C. 1924
BUNTING, DR. HENRY, Hilldale Rd., Bethany, Connecticut 1943
BUNTING, WALTER KENNETH, 1203 W. Washington Ave., Jackson, Michigan 1953
BURCH, ROSE LENORA [MRS. JOHN Q.], 4206 Halldale Ave., Los Angeles 62, California 1947

BURES, JOSEPH A., 148 N. 3rd St., West Newton, Pennsylvania 1944
BURK, DR. MYRLE M., R. R. No. 2, Waterloo, Iowa 1953
BURKHART, MRS. ELIZABETH Z[IMMERMAN], Cedar Crest College, Allentown, Pennsylvania 1949
F BURLEIGH, THOMAS DEARBORN, School of Forestry, University of Idaho, Moscow, Idaho ..... (1913) 1948
BURMEISTER, MELVIN W[ILLIAM], 5753 Dakin St., Chicago 34, Illinois 1948
BURNER, CHARLES C[RAIG], 1410 S. Olive, Pittsburg, Kansas 1946
BURNER, MISS FLORENCE H., 5350 Reisterstown Rd., Baltimore 15, Maryland 1953
BURNETT, MISS FRANCES L., Proctor St., Manchester, Massachusetts 1946
BURNS, ROBERT D[AVID], 1805 Greenleaf Drive, Royal Oak, Michigan 1952
BURNS, ROBERT K[YLE], Carnegie Laboratory of Embryology, Wolfe and Madison Sts., Baltimore 5, Maryland 1947
BURR, DR. IRVING W[INGATE], 265 Littleton St., West Lafayette, Indiana. 1939
BURTON, E[DWARD] MILBY, The Charleston Museum, Charleston, South Carolina 1929
BURTT, HAROLD E., Department of Psychology, Ohio State University, Columbus 10, Ohio 1952
BUSHNELL, MRS. ROBERT G[RAY], 31 Outlook Drive, Noroton, Connecticut 1953
BUSS, IRVEN O[TTO], 1101 Third St., Menomonie, Wisconsin 1939
BUTCHART, G. REEVES, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1950
BUTLER, MRS. CHRISTELLA CAMPBELL, 3 Parkland Ave., Parkland, Pennsylvania 1946
BUTWICK, ALBERT N[ORMAN], Freelton, Ontario, Canada 1951
BUXTON, MRS. JULIAN T., 26 Frank Clarke St., "Cricket Hill," Sumter, South Carolina 1953
BUXTON, ROBERT B[URNS], Box 427, Damariscotta, Maine 1949
BYRD, MITCHELL A[GEE], Virginia Cooperative Wildlife Research Unit, Blacksburg, Virginia 1950
BYRON, RICHARD, Blakeley Corners Rd., East Aurora, New York 1949
CADBURY, JOSEPH M[OORE], Johnson Court No. 1, 16 E. Johnson St., Germantown, Philadelphia, Pennsylvania 1940
CADE, TOM[MY JOE], 526 Gayley, Los Angeles 24, California 1950
CADWALADER, JOHN, JR., Ambler, Pennsylvania 1940
CADY, DR. WALTER G[UYTON], 3350 Calvert Rd., Pasadena 8, California .. 1950
M CAHALANE, VICTOR H[ARRISON], Biology Branch, National Park Service, U. S. Department of the Interior, Washington 25, D. C. ..... (1934) 1946
CAIN, MRS. JAMES R., 108 Park Ave. East, Savannah, Georgia 1947
CAIRNS, JOHN MACKAY, c/o Mrs. J. Bradley, Mount Kemble Lake, Morristown, Nova Scotia 1926
CALDWELL, DOROTHY W., 80 Rockland St., Natick, Massachusetts 1939
CALHOUN, MISS EMMA MAY, 50 Commonwealth Ave., Boston 16, Massachusetts 1921
CALLAHAN, PHILIP SERNA, Box 2003, University of Arkansas, Fayetteville, Arkansas 1953
CALVERT, EARL WELLINGTON, R. R. No. 2, County Home, Lindsay, Ontario, Canada 1936

CALVIN, ROBERT L[EAL], R. R. No. 3, Fairhill Drive, New Castle, Pennsylvania 1950
CALVO, MANUEL J., 4101 Dresden St., Kensington, Maryland 1948
CAMP, MRS. PERCY, 1 Pine St., Cranmoor Manor, Toms River, New Jersey 1953
CAMPBELL, ALBERT LEWIS, 2028 S. 3rd Ave., Maywood, Illinois 1947
CAMPBELL, MRS. ELIZABETH C[ROZER], 821 N. Sawtelle Avenue, Tucson, Arizona 1947
CAMPBELL, J[OHN] D[AVID], 1222 W. State St., Geneva, Illinois 1944
CAMPBELL, JOHN M[ARTIN], R. R. No. 1, Selah, Washington 1951
M CAMPBELL, LOUIS W[ALTER], 4531 Walker Ave., Toledo 12, Ohio ..... (1929) 1939
CAMPBELL, WILLIAM I[RA], 9 Barnesdale Ave. S., Hamilton, Ontario, Canada 1948
CAMRAS, DR. SIDNEY, U. S. Army Hospital, 3444 ASU, Camp Stewart, Georgia 1937
CANNON, JERAULD C[ARLYLE], 2015 N. Madelyn, Tucson, Arizona 1952
CANT, GILBERT, 316 Beach Ave., Mamaroneck, New York 1946
CANTOR, IRVING, 206 W. 104 St., New York 25, New York 1952
CAPLAN, DANIEL RONALD, 545 Elizabeth St., New Milford, New Jersey 1953
CARDIFF, BRUCE E[DWIN], R. F. D. No. 1, Box 304–5, Rialto 2, California 1952
CARDIFF, EUGENE E[LVIN], R. F. D. No. 1, Rialto 2, California 1949
CARL, GEORGE CLIFFORD, Provincial Museum, Victoria, British Columbia, Canada 1941
CARL, HARRY G., 2304 Davie St., Davenport, Iowa 1949
CARLISLE, G[EORGE] LISTER, Norfolk, Connecticut 1920
L CARNES, MRS. HERBERT E., 25 Kenwood Rd., Tenafly, New Jersey 1944
CARPENTER, DR. CHARLES C., Department of Zoological Sciences, University of Oklahoma, Norman, Oklahoma 1952
CARPENTER, MAX M[AYNARD], Route No. 1, Dayton, Virginia 1948
CARRICK, WILLIAM HENESEY, 307 Laird Dr. N., Toronto 17, Ontario, Canada 1952
M CARRIKER, M[ELBOURNE] A[RMSTRONG], JR., Apartado Nac. No. 82, Popayan, Colombia, South America ..... (1912) 1933
CARROLL, ROBERT P., Department of Biology, Virginia Military Institute, Lexington, Virginia 1938
CARSON, HAMPTON L[AWRENCE], JR., Route No. 2, Creve Coeur, Missouri 1935
CARSON, L[ENWOOD] B[ALLARD], 1306 Lincoln St., Topeka, Kansas 1948
CARTER, CHARLES E[DWARD], 1339 30th St., Orlando, Florida 1951
CARTER, T[HOMAS] DONALD, American Museum of Natural History, 79th St. and Central Park West, New York 24, New York 1921
M CARTWRIGHT, B[ERTRAM] W[ILLIAM], Ducks Unlimited, 201 Canada Bank of Commerce, Winnipeg, Manitoba, Canada ..... (1924) 1952
CARTWRIGHT, WILLIAM J[AMES], Williamstown, Massachusetts 1920
CASE, RALPH E., 3 E. Trail, Darien, Connecticut 1949
CASEY, MRS. CLAUDE L., 491 Ockley Dr., Shreveport, Louisiana 1952
CASSEL, J[OSEPH] FRANK[LIN], Zoology Department, North Dakota Agricultural College, Fargo, North Dakota 1935
CASTLE, DR. GERALD H[ARVEY], 1404 Union Central Bldg., Cincinnati 2, Ohio 1950
CASTLE, PETER WATSON, 42 Walker St., Cambridge 38, Massachusetts 1953

CASWELL, EDWIN B., Idaho Coop. Wildlife Res. Unit, University of Idaho, Moscow, Idaho 1952
CASWELL, HERBERT H[ALL], JR., Zoology Department, Cornell University, Ithaca, New York 1952
CAWTHON, WALTER C[LAYTON], JR., 2nd. Plt. "A" Co., 1st. Trng. Bn., 23rd S.B.C., M.C.S., Quantico, Virginia 1952
CAYOUETTE, RAYMOND, Quebec Zoological Garden, Charlesbourg, Canada 1936
CHADWICK, HAROLD K[ING], 176 Ketcham Ave., Amityville, New York .. 1949
L CHALIF, EDWARD LOUIS, Barnsdale Rd., Short Hills, New Jersey 1935
CHALLEY, JOHN R[AYMOND], 1349 Second St. N., Fargo, North Dakota .. 1948
CHAMBERLAIN, CARLYLE D[EHAVEN], 2112 Eastview Ave., Louisville 5, Kentucky 1952
M CHAMBERLAIN, EDWARD BURNHAM, c/o B. R. Chamberlain, 604 Johnston Bldg., Charlotte, North Carolina ..... (1923) 1949
CHAMBERLAIN, FLORENCE CAREY [MRS. JOSEPH], 4255 Lowell Drive, Des Moines 12, Iowa 1953
CHAMBERLAIN, NORMAN A[LLISON], "Critter Hill," Route No. 1, Matthews, North Carolina 1950
CHAMBERLAIN, SAMUEL RENICK, Refugio, Texas 1952
CHAMBERS, KENNETH A[RTHUR], 10 Armstrong Avenue, Yonkers, New York 1953
LM CHAMBERS, W[ILLIE] LEE, Robinson Rd., Topanga, California ..... (1907) 1923
CHANDLER, EMERSON H[ILTZ], 285 Webster St., Auburndale 66, Massachusetts 1951
F CHAPIN, DR. JAMES P[AUL], c/o IRSAC, Boîte Postale 217, Bukavu, Kivu, Belgian Congo ..... (1906) 1921
CHAPIN, DR. JOHN L[ADNER], Physiology Department, University of Colorado Medical School, Denver, Colorado 1950
CHAPIN, RUTH TRIMBLE, [MRS. JAMES PAUL], c/o IRSAC, B. P. 217, Bukavu, Kivu, Belgian Congo 1932
CHAPMAN, DR. FLOYD BARTON, 392 Walhalla Rd., Columbus 2, Ohio 1936
CHAPMAN, HERMAN FLORAINE, 712 S. Dakota Ave., Sioux Falls, South Dakota 1947
CHAPMAN, LAWRENCE B[OYLSTON], R. F. D., Hubbardston, Massachusetts 1930
CHASE, HENRY B[RIGHT], JR., 517 Decatur St., New Orleans 16, Louisiana 1948
CHASE, WARREN JAMES, Alexandria, Nebraska 1952
CHEEK, JOHN A[DAMSEN], JR., 226 N. Fourth St., Danville, Kentucky 1952
CHELL, THOMAS ROSS, 428 W. Virginia, Peoria 5, Illinois 1952
CHESHIRE, W[ILLIAM] F[RANCIS], 4 Waverly Rd., Pointe Claire, Quebec, Canada 1950
CHEW, DR. ROBERT M., Dept. of Zoology, University of So. California, 3518 University Ave., Los Angeles, California 1953
CHILDS, HENRY E[VERETT], JR., San Joaquin Experimental Range, O'Neals, California 1948
CHOATE, DR. ERNEST A., 411 Rodman Avenue, Jenkintown, Pennsylvania 1943
CHRISTIAN, JOHN J[ERMYN], Naval Medical Research Institute, Bethesda 14, Maryland 1948
CHUPP, NORMAN R[ICHARD], 506 W. 6 St., Fremont, Nebraska 1952
L CHURCH, MISS CYNTHIA, The Point, Great Neck, Long Island, New York 1926
CHURCH, RONALD L., 122 Eleventh St., Pacific Grove, California 1953

CHUTE, RICHARD S[EARS], 78 Upland Rd., Brookline 46, Massachusetts.. 1950
CLANCEY, PHILLIP ALEXANDER, Natal Museum, Pietermaritzburg, Natal, South Africa..... 1951
CLANCY, MISS HORTENSE M., 80 Kingston St., Rochester 9, New York.. 1953
CLAPP, RICHARD L[OWELL], Box 359, College of Medical Evangelists, Loma Linda, California..... 1953
HL CLARK, AUSTIN HOBART, 1818 Wyoming Ave., N. W., Washington, D. C. 1899
CLARK, FANNY DWIGHT, [MRS. GRENVILLE], Dublin, New Hampshire.... 1940
CLARK, GEORGE R[OBERTS], W. Valley Green Rd., Flourtown, Pennsylvania..... 1926
CLARK, GREGORY, 119 Crescent Rd., Toronto, Ontario, Canada..... 1951
CLARK, HAROLD WILLARD, Department of Biology, Pacific Union College, Angwin, California..... 1946
CLARK, MRS. THOMAS SANDERS [JOSEPHINE A.], Box 382, Tryon, North Carolina..... 1952
CLARK, DR. THOMAS W., 400 E. Willow Grove Ave., Chestnut Hill, Philadelphia 18, Pennsylvania..... 1946
CLARKE, CHARLES E[VERETT], 76 Ashland St., Medford 55, Massachusetts 1907
M CLARKE, C[HARLES] H[ENRY] D[OUGLAS], c/o Royal Ontario Museum of Zoology, 100 Queen's Park, Toronto, Ontario, Canada.....(1931) 1947
CLARKE, WILLIAM S., JR., Box 167, State College, Pennsylvania..... 1947
L CLARKSON, ELIZABETH BARNHILL, [MRS. EDWIN O.], Wing Haven, 248 Ridgewood Ave., Charlotte, North Carolina..... 1943
CLARKSON, JAMES E., 1400 North Madison Ave., Peoria 3, Illinois..... 1953
CLATTENBURG, ALBERT E[DWIN], JR., American Consulate General, Montreal, Quebec, Canada..... 1929
CLAUSEN, DR. ROBERT T., Department of Botany, Cornell University, Ithaca, New York..... 1928
CLAY, C. I., Box 353, Eureka, California..... 1950
L CLEAVES, HOWARD H[ENDERSON], 8 Maretzek Ct., Staten Island 9, New York..... 1907
CLEGHORN, JAMES DONALD, Zoology Division, Redpath Museum, McGill University, Montreal 2, Quebec, Canada..... 1937
CLEM, ROBERT RERITY, 129 Gillies Rd., Hamden 14, Connecticut..... 1953
CLEMENT, ROLAND C[HARLES], P. O. Box 31, Providence 1, Rhode Island.. 1935
L CLEMENTS, H[IRAM] EVEREST, 49 Stoneham Rd., Rochester 10, New York 1949
CLOTFELTER, J[AMES] W[AYMAN], 121 Duncan Ave., Paris, Kentucky.... 1948
CLOUGH, GARI C[ONDE], S. Plank Rd., R. D. No. 3, Newburgh, New York 1948
CLOW, MISS MARION [FRANCES], P. O. Box 163, Lake Forest, Illinois.... 1929
COBB, BOUGHTON, 180 Madison Ave., New York, New York..... 1948
COBB, DR. STANLEY, 34 Fernald Dr., Cambridge 38, Massachusetts..... 1909
COBLE, MISS MARY FERGUSON, 1357 N. Stanley, Hollywood 46, California. 1953
M COFFEY, BEN BARRY, JR., 672 N. Belvedere, Memphis, Tennessee..(1929) 1950
COFFIN, MRS. FRANCIS HOPKINSON, 1512 Jefferson Ave., Scranton, Pennsylvania..... 1921
COGGINS, HERBERT LEONARD, 2764 Filbert St., San Francisco, California 1898
M COGSWELL, HOWARD L[YMAN], Department of Zoology, Mills College, Oakland 13, California.....(1943) 1952
COLBERT, WILLIAM R., 33 Dahlir Lane, Baltimore 20, Maryland..... 1953
COLE, [MARGARET] EVELYN, Box 433, Greensboro College, Greensboro, North Carolina..... 1950

COLE, RICHARD D[ANIEL], 615 Lake Dr., Towson 4, Maryland 1951
COLLIAS, DR. NICHOLAS E[LIAS], Route 2, Ithaca, New York 1950
COLLIER, GERALD, 3634 N. Muscatel Ave., Rosemead, California 1953
COLLINS, MRS. D[ANIEL] S., [KATHRYN W.], 603 Thomas Ave., Jonesboro, Arkansas 1950
L COLLINS, HENRY HILL, JR., 136 Parkview Avenue, Bronxville 8, New York 1923
COLLINS, PERCY L., 18 Vanderbilt Avenue, Milltown, New Jersey 1949
COLLISTER, ALLEGRA EDITH, [MRS. CARL]. R. R. No. 3, Box 95, Hover Rd., Longmont, Colorado 1949
COLWELL, FREDERICK A[NDREW], R. F. D. No. 2, Collegeville, Pennsylvania 1949
COMAN, DR. DALE REX, 4625 Osage Ave., Philadelphia 43, Pennsylvania 1942
COMBY, JULIUS HUGH, 10044 E. Kratt Lane, Whittier, California 1943
COMFORT, JAMES F[RANK], 27 N. Iola Dr., Webster Groves 19, Missouri .. 1951
COMPTON, MISS DOROTHY M[AY], 22 Wilton St., Princeton, New Jersey .. 1931
COMPTON, DR. LAWRENCE V[ERLYN], Biology Division, Soil Conservation Service, Washington 25, D. C. 1926
CONE, EDWARD T[ONER], Princeton, New Jersey 1933
CONGDON, DR. RUSSELL T[HOMPSON], 122 S. Cleveland, Wenatchee, Washington 1947
CONKEY, JOHN HOUGHTON, 11 Chestnut St., Ware, Massachusetts 1929
CONN, ROBERT C., 755 Ross Lane, Bound Brook, New Jersey 1945
CONNOR, ROBERT J[OSEPH], 429 Beatrice St., Teaneck, New Jersey 1952
CONWAY, ALBERT E[DWARD], Department of Psychology, Lafayette College, Easton, Pennsylvania 1938
CONWAY, WILLIAM G[AYLORD], St. Louis Zoological Gardens, Forest Park, St. Louis 10, Missouri 1951
COOCH, F[REDERICK] GRAHAM, 685 Echo Dr., Ottawa, Ontario, Canada 1952
COOK, FANNYE A[DDINE], 1119 Pinehurst St., Jackson, Mississippi 1924
COOK, ROBERT E[DWIN], Main St., Elverson, Pennsylvania 1950
COOK, [WILLIAM] BOLTON, 20 Irenhyl Ave., Port Chester, New York 1929
LM COOKE, MISS MAY THACHER, Apt. 401, 1400 Fairmont St. N. W., Washington, D. C. ..... (1915) 1926
L COOLEY, MISS ROBIN, Rensselaerville, Albany County, New York 1952
COOLIDGE, HERMAN W., Isle of Hope, R. F. D., Savannah, Georgia 1952
COOLIDGE, PHILIP T[RIPP], Box 102, Bangor, Maine 1919
L COOMBES, ROBERT A[RMITAGE] H[AMILTON], British Museum (Natural History), Tring, Hertfordshire 1935
COOMBS, MRS. ROBERT D., 375 Paramus Rd., Paramus, New Jersey 1953
HL COPE, FRANCIS R[EEVE], JR., Dimock Post Office, Pennsylvania 1892
COPE, JAMES B[ONWILL], Earlham College, Richmond, Indiana 1948
HL COPELAND, MANTON, 88 Federal St., Brunswick, Maine 1900
CORBETT, KENNETH BLAIR, 704 N. Pine St., Lancaster, Pennsylvania 1947
COREY, EBEN F[OX], Barrett's Mill Road, Concord, Massachusetts 1949
CORK, H[ENRY], 73 Queenswood Rd., Forest Hill, London, Southeast, 23, England 1948
CORMIER, FRANCIS, 27 N. Central Ave., Hartsdale, New York 1952
CORSGREEN, ROLF V[ICTOR], 385 Tryon Ave., Englewood, New Jersey ... 1950
F COTTAM, DR. CLARENCE, Fish and Wildlife Service, Washington 25, D. C. (1928) 1942

COTTRELL, G[EORGE] W[ILLIAM], JR., 70 Lakeview Ave., Cambridge 38, Massachusetts 1938
COTTRILLE, DR. W[ILLIAM] POWELL, 6075 Brown's Lake Rd., Jackson, Michigan 1951
COTTRILLE, MRS. W. POWELL, 6075 Brown's Lake Rd., Jackson, Michigan 1953
COURSEN, C[HARLES] BLAIR, 761 E. 69th Pl., Chicago, Illinois 1928
COVERT, JAMES L[EE], 256 Ridgewary Corner, Louisville 7, Kentucky 1949
M COWAN, IAN MCT[AGGART], Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada ..... (1939) 1941
COWAN, JOHN B[ETTS], Gray Lodge Refuge, Gridley, California 1951
COWELL, FRED N[ORMAN], 216 Tamarack St., Timmins, Ontario, Canada. 1952
COX, SAM M[ADISON], 127 N. 10th Ave., East, Duluth 5, Minnesota 1947
COY, ROY E[ARL], St. Joseph Museum, 11th and Charles, St. Joseph 13, Missouri 1951
CRAFT, MRS. F. H., Route 1, Box 123, Guilford College, North Carolina .. 1952
CRAGG, HOYT J., 4451 Tupelo St., Baton Rouge, Louisiana 1947
CRANDALL, JOHN DEW[ITT], Rural Delivery 1, Cohoes, New York 1952
F CRANDALL, LEE SAUNDERS, New York Zoological Park, 185th St. and Southern Bvd., New York, New York ..... (1909) 1951
L CRANE, CORNELIUS, 836 S. Michigan Ave., Chicago, Illinois 1930
CRAWFORD, ALAN, JR., White Horse Rd., Devon, Pennsylvania 1949
CRAWFORD, MARY NEWELL, White Horse Rd., Devon, Pennsylvania 1946
CREAGER, JOE C[LYDE], Drawer 1267-L. A. Cann Dr., Ponca City, Oklahoma 1948
CREWS, FRANCES ROWE, Museum of Zoology, Louisiana State University, Baton Rouge 3, Louisiana 1953
CRINGAN, A. T., Box 565, Sioux Lookout, Ontario, Canada 1948
CROMPTON, DAVIS H[ASTINGS], 74 William St., Worcester, Massachusetts 1934
CROOK, COMPTON, 107 Greenridge Ct., Warren Rd., Phoenix, Maryland .. 1933
CROSSMAN, DR. GEORGE WILLIAM, 1201 Walnut St., Grand Forks, North Dakota 1953
CROUCH, JAMES E[NSIGN], San Diego State College, San Diego 5, California 1928
CROWDER, ORVILLE W., Chase, Maryland 1947
CROWELL, PRINCE S[EARS] JR., Department of Zoology, Indiana University, Bloomington, Indiana 1946
CROWELL, MRS. PRINCE S[EARS], 4 Maple St., Franklin, Massachusetts .. 1930
L CROWNINSHIELD, MRS. FRANCIS, Peach Point, Marblehead, Massachusetts 1941
M CRUICKSHANK, ALLAN D[UDLEY], Rockledge, Florida ..... (1933) 1945
CRUMPACKER, MRS. D. P., Rural Route No. 3, Milan, Missouri 1952
CRUNKLETON, TOLLIVER, Box 494, Highlands, North Carolina 1953
CRUTTENDEN, JOHN R., Blackstone Building, Quincy, Illinois 1940
CRYMES, FRANK HODGES, 503 Beloit Ave., Berkeley 8, California 1940
CULBERTSON, A. E., 529 Ashlan Avenue, Fresno 4, California 1952
CUMMING, FAIRMAN P., Box 330, Nashville 1, Tennessee 1952
CUMMING, JOHN ALLARDES, 84 Grosvenor Ave. S., Hamilton, Ontario, Canada 1953
CUMMINGS, G[EORGE] CLARK, Room 1018, 61 Broadway, New York 6, New York 1951
CUNNINGHAM, JAMES W., 3009 E. 19th St. Terrace, Kansas City, Missouri 1937
CUNNINGHAM, JOHN D., 1311—5th St., Santa Monica, California 1953

CUNNINGHAM, RICHARD L[YNN], 216 Oliver Lee Dr., Belleville, Illinois.... 1952
CURL, DR. A[LFRED] LAURENCE, 751 Balra Dr., El Cerrito 8, California.. 1950
CURRY, HASKELL B[ROOKS], Department of Mathematics, The Pennsylvania State College, State College, Pennsylvania..... 1943
CURTIN, DAVID Y., 115 W. Montclair, Urbana, Illinois..... 1953
L CURTIS, RICHARD C[ARY], 30 State St., Boston, Massachusetts..... 1935
CURTIS, MRS. VEE KAELIN, 1450 Bancroft Way, Berkeley 2, California.. 1947
CUTHBERT, NICHOLAS L[E HURAY], Central Michigan College, Mount Pleasant, Michigan..... 1951
CUTLER, MRS. EDITH M[AE], Possum Hill, Green Village, New Jersey.... 1951
CUTRESS, CHARLES E., 5620 Southeast Aldercrest Rd., Milwaukie, Oregon 1946
CUZA, JOSEPH A., 4237 Regent St., Philadelphia 4, Pennsylvania..... 1953
DALLAS, DONALD E[DWARD], JR., 14108 Strathmore Ave., East Cleveland 12, Ohio..... 1953
DAMBACH, CHARLES A[RTHUR], 7085 Linworth Rd., R. F. D. No. 2, Worthington, Ohio..... 1938
DANA, EDWARD F[OX], 57 Exchange St., Portland, Maine..... 1941
DANIELS, GEORGE GOETZ, 88 Woodland Rd., Short Hills, New Jersey.... 1947
DARBY, R[OLLO] E[VERETT], 2103 Walnut, Carmichael, California..... 1950
DARBY, RICHARD T[HORN], 5046 Chancellor St., Philadelphia 39, Pennsylvania..... 1936
DATER, MRS. JOHN Y., JR., [ELEANOR E.], 259 Grove St., Ramsey, New Jersey..... 1949
DAVENPORT, MRS. ALLEN G[RAHAM], [MABELLE GRIFFITH], 39 Walcott Ave., Jamestown, Rhode Island..... 1951
DAVEY, STUART P., Box 538, Lexington, Virginia..... 1952
DAVEY, DR. WINTHROP N., University Hospital, Ann Arbor, Michigan... 1946
DAVIDS, JEAN LINEA [MRS. C. HARVEY], 726 Eleventh St., Wilmette, Illinois..... 1951
DAVIDSON, [MISS] SARAH A., 344 Summit Ave., St. Paul 2, Minnesota... 1952
DAVIDSON, WILLIAM M[ARK], 1504 Bodell St., Orlando, Florida..... 1927
DAVIE, PAUL MARTIN, 148 Scott Avenue, Wellsville, New York..... 1953
DAVIS, BERTHA E[UNICE], 44 Centre St., Brookline, Massachusetts..... 1920
DAVIS, CLIFFORD V[ERNON], 730 S. Tracy St., Bozeman, Montana..... 1948
M DAVIS, DR. DAVID E[DWARD], School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Maryland.....(1935) 1941
DAVIS, EARLE A., JR., Buena Vista College, Storm Lake, Iowa..... 1946
DAVIS, DR. EDWIN G[RIFFITH], 4633—28th Rd. S., Arlington, Virginia.... 1940
DAVIS, GERTRUDE L. [MRS. JAMES M.], 203 Collingsworth Dr., Rochester 10, New York..... 1949
DAVIS, HOWARD HENRY, Little Stoke, Patchway, nr. Bristol, England.... 1946
DAVIS, DR. JOHN, Hastings Reservation, Carmel Valley, California..... 1939
DAVIS, L[OUIE] IRBY, Box 988, Harlingen, Texas..... 1935
DAVIS, MALCOLM, 904—11th St., S. E., Washington, D. C..... 1938
DAVIS, PAUL A[NTHONY], 829 Grant St., Gary, Indiana..... 1953
DAVIS, PLATT [ADAMS], 1947 Marion St., Albany, Oregon..... 1951
DAVIS, SAMUEL BANCROFT, 24 James St., Yarmouth C., Nova Scotia.... 1953
M DAVIS, DR. WILLIAM B., Department of Wildlife Management, A. and M. College of Texas, College Station, Texas.....(1938) 1949
DAVIS, WILLIAM E[DWIN], Old Acres, R. F. D., Bedford, Massachusetts.. 1949

DAVIS, WILLIAM FRANKLIN, 423 W. 46th St., Ashtabula, Ohio..... 1947
DAVISSON, A[RTHUR] PAUL, 1112 Fleming Ave., Fairmont, West Virginia.. 1949
DAWE, ARNOLD L[EWIS], R. R. No. 2, Weston, Ontario, Canada..... 1948
DAWN, WALTER H[ENRY], 53–55—64th St., Ridgwood Plateau, Maspeth 78, Long Island, New York..... 1947
DAWSON, RICHARD G[LEN], Room 314, Davis Hall, Carleton College, Northfield, Minnesota..... 1949
DAWSON, DR. WILLIAM RYAN, Department of Zoology, University of Michigan, Ann Arbor, Michigan..... 1947
DAY, MRS. KATHARINE C[LARK], Grouse Hollow, R. R. No. 3, Box 474, Eugene, Oregon..... 1940
DEAN, A. LAWRENCE, Department of Poultry Husbandry, Virginia Polytechnic Institute, Blacksburg, Virginia..... 1939
DEAN, MRS. BLANCHE E., 1503 Ridge Rd—Homewood, Birmingham 9, Alabama..... 1949
DEAN, WILLIAM B., 282 Lake St., Seekonk, Massachusetts..... 1946
L DEANE, MRS. RUTHVEN, 830 Hibbard Rd., Winnetka, Illinois..... 1935
DEAR, L[IONEL] S[EXTUS], P. O. Box 146, Port Arthur, Ontario, Canada.. 1928
DEARBORN, JOHN H., 382 Commonwealth Ave., Boston 15, Massachusetts 1952
DEBES, V[ICTOR] A[LBERT], 1211 Folsom Ave., Prospect Park, Pennsylvania 1929
DECAMPS, ERNEST JULES, Box 316, Beaufort, South Carolina..... 1946
DECHEN, MRS. LILLIAN O[RVETTA], 14 Summer St., Port Dickinson, Binghamton 6, New York..... 1949
DECKER, ANTON M[ICHAEL], Box 402, Middlebury, Vermont..... 1949
DECOU, RICHARD W[ILLIAM], Crosswicks, New Jersey..... 1949
DE DOBBELEER, MARCEL, R. R. No. 2, Granton, Ontario, Canada..... 1953
DEFLON, DR. ERIC G., 242 Pine, Chadron, Nebraska..... 1950
DEGROOT, DR. DUDLEY S[ARGENT], 2808 General Chennault, Albuquerque, New Mexico..... 1947
F DEIGNAN, HERBERT G[IRTON], Division of Birds, U. S. National Museum, Washington 25, D. C.....(1923) 1946
F DELACOUR, JEAN, Los Angeles County Museum, Exposition Park, Los Angeles 7, California.....(1920) 1946
DE LA VEGA, MARIO, JR., c/o Sucs. de Alonso y Cia, S. A., Apartado No. 337, Havana, Cuba..... 1949
DEL CAMPO, RAFAEL [SANCHEZ] MARTIN, Instituto de Biologia, Casa del Lago, Chapultepec, Mexico D. F., Mexico..... 1948
DELIME, JOHN L., St. Marks National Wildlife Refuge, St. Marks, Florida 1952
DEL TORO, MIGUEL ALVAREZ, Apartado Postal Number 6, Tuxtla Gutierrez, Chiapas, Mexico..... 1947
DELURY, DR. RALPH E[MERSON], 330 Fairmont Ave., Ottawa, Ontario, Canada..... 1920
DEMPSTER, A. NORMAN, 121 Roosevelt Blvd., Fords, New Jersey..... 1953
DENHAM, REGINALD, 100 Central Park South, New York, New York.... 1947
DENKER, CHARLES REED, c/o DuPont, S. A. Apartado 1799, Mexico D. F., Mexico..... 1944
DENMAN, CLAYTON C., 1751 Naomi Place, Seattle 5, Washington..... 1947
DENMEAD, TALBOTT, 2830 St. Paul St., Baltimore 18, Maryland..... 1923
DENNEY, DR. JOHN DEWITT, 30 S. 2nd St., Columbia, Pennsylvania..... 1951
DENNIS, JOHN V[ALUE], Wildlife Management Research, Southern Illinois University, Carbondale, Illinois..... 1948

DENNISON, MISS BESSIE, 160 Grenadier Rd., Toronto, Ontario, Canada.. 1952
M DENTON, DR. J[AMES] FRED, 1510 Pendleton Rd., Augusta, Georgia. (1935) 1950
HL DERBY, DR. RICHARD, Oyster Bay, Long Island, New York..... 1898
LF DE SCHAUENSEE, RODOLPHE M[EYER], Devon, Pennsylvania.....(1925) 1942
L DESMOND, THOMAS C[HARLES], Box 670, Newburgh, New York..... 1929
DETTMANN, WARREN, Milwaukee Public Museum, Milwaukee, Wisconsin 1936
DEUEL, H[AROLD] F[RANCIS], 110 Hill, Arcata, California..... 1950
DEUSING, MURL, Milwaukee Public Museum, Milwaukee, Wisconsin.... 1935
DEVANEY BERNARD C[HARLES], 212 Nevin St., Lancaster, Pennsylvania.. 1948
DE VEL, DR. LEON, 739 Plymouth Blvd. S. E., Grand Rapids 6, Michigan 1948
DEVITT, OTTO EDMUND, 68 Donegall Drive, Toronto 17, Ontario, Canada. 1933
DE WEESE, JOHN RUTLEDGE, P. O. Box 508, Key West, Florida..... 1953
DEXTER, DR. RALPH W[ARREN], Kent State University, Kent, Ohio..... 1942
DICE, DR. LEE RAYMOND, Institute of Human Biology, University of Michigan, Ann Arbor, Michigan..... 1944
DICKENS, MISS ELIZABETH, Dickens Point, Block Island, Rhode Island.. 1921
DICKENSON, MRS. LEILA B[RUNDAGE], 19 Burling Ave., White Plains, New York..... 1952
L DICKEY, MRS. FLORENCE V. V., 2100 Jackson St., San Francisco 15, California..... 1948
DICKIE, MRS. ROY N. [EVA S.], 3840 Loquat Ave., Miami 33, Florida.... 1952
M DICKINSON, DR. J[OSHUA] C[LIFTON], JR., Department of Biology, University of Florida, Gainesville, Florida.....(1937) 1952
DIEDRICH, JOHN LESTER, 3125 West Pierce St., Milwaukee 4, Wisconsin.. 1948
DIETZ, VIOLA V[ERONICA], 60 N. Tremont St., York, Pennsylvania..... 1949
DIGNAM, JOHN HUGH, 64th St. Clair Ave., W., 108, Toronto, Ontario, Canada..... 1953
DILGER, WILLIAM C., Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York..... 1951
DILLEY, WILLARD E., 104th N. E. 18th St., Homestead, Florida..... 1936
DILLMAN, MRS. ALBERT F. [NORA G.], 62 Newton Ave., Sussex, New Jersey 1951
DINGLE, EDWARD VON SIEBOLD, Huger, South Carolina..... 1920
DINGLE, HUGH, R. R. No. 2, Rosedale Rd., Princeton, New Jersey..... 1953
DITTEMORE, LESTER POE, 1207 Byron Ave., Topeka, Kansas..... 1952
DIXON, JAMES B[ENJAMIN], R. R. No. 3, Box 1143, Escondido, California.. 1939
DIXON, JAMES E., R. R. 1, Box 429, Escondido, California..... 1953
DIXON, DR. KEITH L[EE], Department of Wildlife Management, A. and M. College of Texas, College Station, Texas..... 1943
DIXON, RALPH E., Star Route Box 810, Escondido, California..... 1947
DOBSON, JEROME J[OHN], R. R. No. 1, Box 144, Exeter, California..... 1952
DODGE, ERNEST S[TANLEY], Peabody Museum, Salem, Massachusetts.... 1936
DODGE, VICTOR K[ENNY], 137 Bell Court West, Lexington, Kentucky.... 1937
DOEPEL, MRS. HENRY W. [LESLIE O.], 30 Cooper Lane, Larchmont, New York..... 1952
DOERING, HUBERT R[AYMOND], 82 E. Elm St., Chicago 11, Illinois..... 1944
DORN, JOSEPH LAMBERT, Jesuit High School, 4133 Banks St., New Orleans 19, Louisiana..... 1953
DORNAN, JOHN E., Graver's Lane and Flourtown Rd., Chestnut Hill, Philadelphia 18, Pennsylvania..... 1947
D'OSTILIO, DOMINICK O[RLANDO], 869—24th St., Boulder, Colorado..... 1952

DOUGLASS, DONALD W[ICKWARE], Game Division, Michigan Department of Conservation, Lansing 13, Michigan 1943
DOWLING, P[AUL] BRUCE, 332 W. Dallas St., Mount Vernon, Missouri... 1950
DOWN, E. H., 28, Lynton Mead, Totteridge, London N. 20, England.... 1952
DOWNS, DR. THEODORE, Los Angeles County Museum, Exposition Park, Los Angeles 7, California 1942
DREIS, ROBERT E[DWARD], Conservation Biologist, Area III Headquarters, Black River Falls, Wisconsin 1952
DRESSEL, EVAN C[HARLES], Western Reserve Road, R. R. No. 1, Poland, Ohio 1949
DRESSER, MRS. JAMES D., JR., 9620 Von Thaden, R. R. No. 4, Wichita, Kansas 1950
DREW, GEORGE A[LBERT] JR., 81 Old Concord Rd., Belmont 78, Massachusetts 1951
DRINKWATER, HOWARD [FRANK], Old Rd., Whitehouse, New Jersey..... 1950
DRISCOLL, DOROTHY H., 203 Aspinwall Ave., Brookline 46, Massachusetts 1951
DRIVER, E. RAYMOND, Box 234, R. R. No. 1, Central Point, Oregon..... 1946
DROVEDAHL, MRS. EDWARD [LOUISE M.], 11365-Coyle Ave., Detroit 27, Michigan 1953
DRURY, LOIS M[AUDE], 1 Buena Vista Court, Urbana, Illinois..... 1951
DRURY, DR. WILLIAM HOLLAND, JR., Biological Laboratories, 16 Divinity Ave., Cambridge 38, Massachusetts..... 1935
M DUBOIS, ALEXANDER DAWES, Christmas Lake Rd., R. R. No. 4, Excelsior, Minnesota.....(1905) 1950
DUDLEY, JOHN MURCHIE, 20 Germain St., Calais, Maine..... 1931
DUFF, CARROLL VICTOR, 1922 Tamarind Ave., Hollywood 28, California.. 1953
DUFFIELD, MRS. J. W. [MARJORIE O.], Box 552, Placerville, California 1952
DUFFY, JOHN J[OSEPH], JR., 1707 S. Henning Ave., Evansville 14, Indiana 1952
M DUMONT, PHILIP A[TKINSON], 4114 Fessenden St., N. W., Washington 16, D. C.....(1927) 1941
DUNDAS, LESTER HARVEY, Rice Lake Wildlife Refuge, East Lake, Minnesota 1941
DUNHAM, MRS. CAROLINE A[LLEN], 450 Beverly Rd., Ridgewood, New Jersey 1933
DUNLAP, DR. V[INING] C[AMPBELL], Bowdoinham, Maine..... 1950
DUNNING, JOHN S[TEWART], 150 Notch Rd., Granby, Connecticut..... 1950
DUNNING, ORVILLE M., 22 Longridge Rd., Plandome, New York..... 1952
M DUVALL, ALLEN J[OSEPH], U. S. National Museum, Washington, D. C. (1935) 1948
DYER, WILLIAM, 402 John St., Union City, Michigan..... 1946
DYKE, SAM[UEL] H[ULL], R. R. No. 6, Lancaster, Pennsylvania..... 1949
EASTMAN, FRANCIS B[UCK], P. O. Box 96, Mandeville, Louisiana..... 1909
EASTMAN, WHITNEY [HASKINS], 4450 West Lake Harriet Blvd., Minneapolis 10, Minnesota 1949
EATON, RICHARD J[EFFERSON], Bedford Rd., Lincoln, Massachusetts.... 1930
EATON, STEPHEN W[OODMAN], Department of Biological Sciences, St. Bonaventure College, St. Bonaventure, New York..... 1942
EBERT, MRS. ERNEST C. [RUTH], 1318 Capital Way, Capital Apartments No. 107, Olympia, Washington 1946
EBERT, PAUL WILLIAM, R. R. No. 4, The Dalles, Oregon..... 1952

ECKELBERRY, DON [RICHARD], 4 Foster Lane, Babylon, Long Island, New York 1942
EDDY, GARRETT, 4515 Ruffner St., Seattle 99, Washington 1939
EDDY, DR. S[TANTON] S[EELY] JR., 93 Main St., Middlebury, Vermont 1951
EDEBURN, RALPH M[ILTON], Marshall College, Huntington 1, West Virginia 1947
EDEY, MAITLAND A[RMSTRONG], Wolver Hollow Rd., Brookville, Long Island, New York 1948
EDGE, MRS. CHARLES NOEL, Emergency Conservation Committee, 767 Lexington Ave., New York, New York 1938
HL EDSON, JOHN MILTON, 336 W. 50th St., Seattle, Washington 1886
EDWARDS, ALICE N[ETTLETON] [MRS. O. M.], Grassy Lane Farm, Cazenovia, New York 1949
EDWARDS, DR. ERNEST P[RESTON], Box 611, Amherst, Virginia 1949
EDWARDS, FRANK, "Ballabag," The Point, Port Saint Mary, Isle of Man, England 1949
EDWARDS, DR. KENNETH F[REDERICK], 169 Hillendale Ave., Bath Road P. O., Kingston, Ontario, Canada 1952
EGERTON, FRANK N[ICHOLAS] III, 411 N. Gregson St., Durham, North Carolina 1952
EHLERS, MRS. JOHN, R. R. No. 1, Gladbrook, Iowa 1952
EICHLER, HERBERT P., 2211 Andrews Ave., New York 53, New York 1947
EINHORN, BENJAMIN, 7 Parker Ave., West Deal, New Jersey 1946
EISENHART, RUTH C[ECILIA], Union Theological Seminary Library, 3041 Broadway, New York 27, New York 1949
LM EISENMANN, EUGENE, 11 Broadway, New York 4, New York .....(1936) 1951
EISENMAYER, BETTY J[EAN], 1917 N. Main Ave., Springfield 1, Missouri .. 1950
EKBLAW, GEORGE E[LBERT], 511 W. Main St., Urbana, Illinois 1946
EKDAHL, CONRAD H[OWARD], Box 1246, Daytona Beach, Florida 1948
EKLUND, DR. CARL M[ILTON], Rocky Mountain Laboratory, Hamilton, Montana 1950
L ELDREDGE, EVERETT, Chatham, Cape Cod, Massachusetts 1928
ELIOT, SAMUEL A[TKINS], JR., 31 Dryads Green, Northampton, Massachusetts 1936
ELIOT, THEODORE L[YMAN], 401 Golden Gate Ave., Belvedere, California .. 1940
ELKINS, KIMBALL C[ONRO], 3½ Madison St., Cambridge, Massachusetts .. 1940
ELLARSON, ROBERT S[COTT], 424 University Farm Place, Madison 6, Wisconsin 1952
ELLIOTT, CHARLES FREMONT, 75 Anderson St., Hackensack, New Jersey .. 1936
ELLIOTT, JOHN JACKSON, 3994 Park Ave., Seaford, Long Island, New York 1940
ELLIS, HAZEL ROSETTA, Keuka College, Keuka Park, New York 1935
ELLWOOD, JAMES R., Sheldon Rd., R. D. No. 2, Valencia, Pennsylvania .. 1950
ELSTONE, ROBERT O[LIVER], 249 Charlton Ave. W., Hamilton, Ontario, Canada 1950
ELY, CHARLES [ADELBERT], R. D. No. 2, Wellsboro, Pennsylvania 1948
EMERSON, DAVID LOWELL, 155 Burt St., Taunton, Massachusetts 1940
EMERSON, GUY, 16 E. 11th St., New York 3, New York 1947
EMERSON, MISS MARY LOUISE, 587 Ashland Ave., Buffalo 22, New York .. 1949
EMERSON, STEPHEN, 806 W. Main St., Urbana, Illinois 1950
EMERY, F[RANK] H[ARDIE], 29 Old Mill Terrace, Toronto, Ontario, Canada 1928
M EMILIO, S[HEPARD] GILBERT, Gilford, New Hampshire .....(1922) 1938

F EMLEN, DR. JOHN T[HOMPSON], JR., Department of Zoology, University of Wisconsin, Madison 6, Wisconsin.....(1925) 1949
ENGEL, G[EORGE] CURTIS, 460 Spring Ave., Ridgewood, New Jersey..... 1951
ENGLISH, ALMON OWEN, 2803 Rosalind Ave. S. W., Roanoke, Virginia... 1928
ENNIS, DR. J(AMES)HAROLD, CORNELL COLLEGE, MOUNT VERNON, IOWA... 1941
ENSSLER, HARRY THOMAS, 411 Waverly Rd., Wyncote, Pennsylvania.... 1946
EPHRAIM, WILLIAM A[BBE], 1630 Grand Ave., Bronx, New York 53, New York..... 1949
ERICKSON, DR. ARNOLD BURTON, 1005–06 Commerce Bldg., Saint Paul 1, Minnesota..... 1936
ERICKSON, DR. JOHN G[ERHARD], 611 N. Lilac Dr., Minneapolis 22, Minnesota..... 1952
M ERICKSON, DR. MARY MARILLA, 3505 Foothill Rd., Santa Barbara, California.....(1947) 1950
ERICKSON, RAY C[HARLES], 1104 Washington Ave., St. Peter, Minnesota.. 1946
ERNST, ROGER, 170 Sargent Rd., Brookline, Massachusetts..... 1941
F ERRINGTON, DR. PAUL L[ESTER], Insectary, Iowa State College, Ames, Iowa.....(1932) 1936
ESCHELMAN, DR. KARL F[ERDINAND], 8 North Drive, Buffalo 16, New York 1949
EVANS, DR. EVAN MORTON, 550 Park Ave., New York, New York..... 1916
EVANS, J[OHN] HARWOOD, 517 Jackson Dr., Oshkosh, Wisconsin..... 1948
EVANS, Z[ACCHEUS] BOND, Aurora, Preston County, West Virginia..... 1953
EVENDEN, FRED G[EORGE], JR., 3434 57th St., Sacramento 20, California.. 1949
EVERETT, MISS CONSTANCE A[NTOINETTE], 206—9th St., N. E., Waseca, Minnesota..... 1948
EYER, LESTER E[MERY], 833-A. Chestnut Rd., East Lansing, Michigan.. 1948
EYNON, ALFRED ERNEST, 5 Beach Rd., Verona, New Jersey..... 1934
EYRE, JOHN ALFRED, 460 Gladstone Ave., Toronto 4, Ontario, Canada... 1946
EYSTER, MARSHALL B[LACKWELL], Department of Biology, Box 545, Southwestern Louisiana Institute, Lafayette, Louisiana..... 1949
FAGER, DR. EDWARD W[ILLIAM], 543 Cleanmount Dr., Youngstown 11, Ohio..... 1950
FAIRBANKS, MRS. PAUL H. [VIRGINIA B.], United States Forest Service, Pinehurst Ranger Station, Miramonte, California..... 1948
FALES, JOHN H[OUSE], 1917 Elkhart St., Silver Spring, Maryland..... 1939
FARGO, WILLIAM GILBERT, 506 Union St., Jackson, Michigan..... 1923
M FARNER, DR. DONALD S[AUKEY], Department of Zoology, The State College of Washington, Pullman, Washington.....(1941) 1946
FARRAR, MERRITT C[ALVIN], 942 Bonita Dr., Winter Park, Florida..... 1946
FARREL, FRANKLIN, 3RD., Northrup Rd., Woodbridge, Connecticut..... 1950
FARRINGTON, S[ELWYN] KIP, JR., Main St., East Hampton, Long Island, New York..... 1949
FASNACHT, CARL L., 328 E. Ross St., Lancaster, Pennsylvania..... 1951
FAST, ARTHUR H., 4924 Rock Spring Rd., Arlington, Virginia..... 1946
FAUTIN, DR. REED WINGATE, Department of Zoology and Physiology, University of Wyoming, Laramie, Wyoming..... 1938
FAUVEL, BERTRAM A., 263 McLeod St., Ottawa, Ontario, Canada..... 1948
FAVER, MRS. WILLIAM H[OWARD], Eastover, South Carolina..... 1951
FEENEY, REV. THOMAS J[OHN], 422 E. 10th St., Davenport, Iowa..... 1948
FEGEL, ARTHUR C., Box 840, R. F. D. No. 1, Rahway, New Jersey..... 1943
FEHON, JACK H[AROLD], Department of Zoology, Florida State University, Tallahassee, Florida..... 1951

FEIGHNER, MISS LENA VETA, 298—I S. Tremont St., Kansas City, Kansas 1934
FEINBERG, EZRA J[OHN], 41 W. 72nd St., New York City 23, New York 1951
FEINGOLD, MISS ROSE, 4206 St. Charles Ave., New Orleans 15, Louisiana 1952
FELDMAN, ALBERT EDWARD, 187 Strathmore Rd., Brighton 35, Massachusetts 1952
FENNELL, CHESTER M[ARTIN], 21475 Hillsdale Ave., Fairview Park 26, Ohio 1948
FERDINAND, DR. [PETER] L[ORENZ], Scr. Kjeldsgade 12, Copenhagen, Denmark 1949
FERGUSON, DAVID SOWERS, Box 53, R. R., Philipsburg, Pennsylvania 1937
FERGUSON, WILLIAM HENRY, 5907 Mason St., Omaha, Nebraska 1946
FERNANDEZ, DRA. RAMONA, Museo Poey, Catedra "U," Escuela de Ciencias, University de la Habana, Habana, Cuba 1950
FICKE, BRUCE L[EE], 12 Godfrey Place, Wilton, Connecticut 1951
FICKETT, STEPHEN BURROWS, JR., P. O. Box 343, Branford, Florida 1948
FIELD, MARSHALL [HOWARD], R. R. 2, St. Thomas, Ontario, Canada 1948
FILER, ERVIN E., Little Sister Farms, St. David, Illinois 1950
FILLEBROWN, THOMAS SCOTT, Box 27, Woodstock, Vermont 1947
FINDLEY, JAMES SMITH, Museum of Natural History, University of Kansas, Lawrence, Kansas 1948
FINDLEY, J[OHN] S[COTT], 1201 S. Center Ave., Sioux Falls, South Dakota. 1950
FINLEY, DR. JOHN C., Meaford, Ontario, Canada 1953
FISCHER, RICHARD B., Laboratory of Ornithology, Fernow Hall, Cornell University, Ithaca, New York 1947
FISCHER, RUDOLPH, 215 E. Foothill Blvd., LaVerne, California 1949
FISH, DR. WILLIAM R[ALPH], 302-B Entwistle St., China Lake, California. 1951
F FISHER, DR. HARVEY IRVIN, Department of Zoology, University of Illinois, Urbana, Illinois ..... (1944) 1950
FE FISHER, DR. WALTER K[ENRICK], Hopkins Marine Station, Pacific Grove, California ..... (1899) 1905
FISHER, WALTER TAYLOR, 949 Fisher Lane, Winnetka, Illinois 1932
FISK, DR. GUY H., 592 Walpole Ave., Montreal 16, Quebec, Canada 1947
FITCH, DR. HENRY SHELDON, Natural History Reservation, University of Kansas, R. R. No. 3, Lawrence, Kansas 1946
FITZGERALD, DR. JAMES L[YNN], 130 No. 14th St., Allentown, Pennsylvania 1952
FITZSIMONS, OGDEN, Box 202, Kimberton, Pennsylvania 1952
FLACH, MAJOR B[ENGT] [ERIKSSON], Flygvapnet (Royal Swedish Air Force) Stockholm 80, Sweden 1951
FLEETWOOD, RAYMOND J[UDY], Bosque del Apache National Wildlife Refuge, San Antonio, New Mexico 1942
FLEISHER, DR. EDWARD, 20 Plaza St., Brooklyn 38, New York 1943
FLEMING, ROGER, Box 122, Woodsboro, Texas 1953
FLEMING, MRS. THOMAS, 1541 Lombardy Rd., Pasadena, California 1935
FLETCHER, A. J., R. R. No. 1, Denton, Maryland 1953
FLINTON, LAUREL, JR., 1288 Lloyd George Ave., Crawford Park, Verdun, Quebec, Canada 1950
FLOOD, GRACE [MRS. AUBREY CLEVELAND], 455 Linden Rd., Birmingham, Michigan 1933
FLOWERS, RICHARD H., JR., Box 735, Greenwood, Mississippi 1953

FLOYD, CHARLES BENTON, 454 Wolcott St., Auburndale, Massachusetts.. 1916
FLUCK, DR. PAUL HAVENS, 73 N. Union St., Lambertville, New Jersey.... 1948
FLUEKIGER, MISS DORA WHILMAN, Hotel Dauphin, Broadway at 67th St., New York 23, New York..... 1947
FOGLE, ORIN G[OOD], P. O. Box 695, Hallandale, Florida..... 1951
FOLEY, EDWARD J[AMES], 5349 N. Bay Ridge Ave., Milwaukee 11, Wisconsin..... 1947
FOLLETT, WILBUR IRVING, 3501 Broadway, Oakland 11, California..... 1946
FONAROFF, LEONARD, 115 A Polo Village, Tucson, Arizona..... 1952
L FORBES, HOWARD M., 87 Church St., Weston, Massachusetts..... 1953
FORD, CHARLES E[DWARD], S. Orchard Rd., Vineland, New Jersey..... 1952
FORD, WINFRED N[ATHAN] JR., 31 N. Chenango St., Greene, New York.. 1949
FORDHAM, STEPHEN C[RANE], JR., Delmar Game Farm, Delmar, New York 1946
FOREE, DR. LYNN, 379—30th St., Oakland 11, California..... 1952
FORWARD, MRS. TRACY C., Ione, Colorado..... 1949
L FOSTER, FRANCIS A[PTHORP], Box 31–A, R. R., Vineyard Haven, Massachusetts..... 1918
FOSTER, H. LINCOLN, R. F. D., Falls Village, Connecticut..... 1952
FOSTER, [JOHN] BRIS[TOL], 136 Dawlish Ave., Toronto 12, Ontario, Canada 1949
L FOSTER, JOHN HAWLEY, Wayne, Pennsylvania..... 1927
FOSTER, THOMAS [HENRY], West Rd., Bennington, Vermont..... 1948
HL FOWLER, HENRY WEED, Academy of Natural Science, 19th St. and Parkway, Philadelphia, Pennsylvania..... 1898
FOX, ADRIAN C[ASPAR], Box 1451, Lincoln, Nebraska..... 1935
FOX, JENNIE ETHEL, Palisades, Rockland Co., New York..... 1925
FOX, ROBERT P., 311 Beale St., Wollaston 70, Massachusetts..... 1951
FOX, DR. WADE, JR., Department of Anatomy, Louisiana State University School of Medicine, New Orleans, Louisiana..... 1947
FRANCIS, C. STUART, Spruce Dale Farm, Torch River, Saskatchewan, Canada..... 1947
FRANZEN, A[LBERT] J[OHN], Chicago Natural History Museum, Chicago, Illinois..... 1934
FRAZIER, FRANK P[EARSALL], 424 Highland Ave., Upper Montclair, New Jersey..... 1951
FREDRICKSON, RICHARD WILLIAM, 6D, Sunnyside, University of Kansas, Lawrence, Kansas..... 1947
FREE, GEORGE J[AMISON], 626 Sunset Rd., State College, Pennsylvania.... 1935
FREEMAN, FRANK JEROME, 2827 Val Verde, N. E., Albuquerque, New Mexico..... 1947
FREER, MRS. MARIAN F[RANCES], Box 87, Plains, Montana..... 1949
FRENCH, MRS. ANNA MORTON, 19 Olyphant Pl., Morristown, New Jersey.. 1946
FRENCH, DR. J. DOUGLAS, 732 Golden West Ave., Arcadia, California.... 1946
L FRENCH, MENA VESTAL [MRS. GEORGE EDWARD], Box 171, Wayland, Massachusetts..... 1923
FRENCH, NORMAN ROGER, Division of Biology, University of Utah, Salt Lake City 1, Utah..... 1953
L FREY, MRS. EDITH KRIEGER, 814—3rd St., Jackson, Michigan..... 1923
FREYBURGER, DR. WALTER ALFRED, JR., 934 Grant St., Kalamazoo, Michigan..... 1943
FRIEDERS, REV. FABIAN, St. Meinrad's Abbey, St. Meinrad, Indiana.... 1950

FRIEDLANDER, NORMAN, 112 W. 44th St., New York, New York 1948
FRIEDMAN, RALPH, 14 E. 75th St., New York, New York 1921
F FRIEDMANN, DR. HERBERT, Division of Birds, U. S. National Museum, Washington 25, D. C. ..... (1921) 1929
FRISTER, CARL P[HILLIP], 2956 A. N. 38th St., Milwaukee 10, Wisconsin .. 1950
FRITH, ROWLEY, 65 Acacia Ave., Ottawa, Ontario, Canada 1947
FROEHLICH, MRS. DAVID E., 321 El Cerrito Ave., Piedmont 11, California. 1953
FROST, CHARLES M[ESHECH], 623 Oaklawn Ave., Winston-Salem, North Carolina 1953
FROST, HERBERT H., Ricks College, Rexburg, Idaho 1953
FRY, MRS. GLADYS GORDON, 66 Eagle Rock Way, Montclair, New Jersey 1925
FRY, VARIAN, 56 Irving Place, New York 3, New York 1946
FRYE, OZRO EARLE, JR., Game and Fresh Water Fish Commission, Tallahassee, Florida 1947
FUHRMANN, DR. JOHN B[ARCLAY], 5 Main St., Flemington, New Jersey 1950
FULLER, W[ILLIAM] A[LBERT] [LENNOX], Fort Smith, Northwest Territories, Canada 1950
FULTON, W. F., R. R. No. 2, Maidstone, Ontario, Canada 1952
FURNISS, OWEN CECIL, Box 756, Alberni, British Columbia, Canada 1931
GABORIAULT, WILFRID, St. Viator High School, 7315 de Lanaudiere St., Montreal 35, Quebec, Canada 1953
F GABRIELSON, IRA N[OEL], R. R. No. 2, Box 195, Vienna, Virginia ... (1912) 1938
GAELICK, NORMAN F., 924-18 Avenue S. E., Calgary, Alberta, Canada ... 1953
L GAGE, KATHLEEN R., [MRS. CHARLES E.], 401 Great Falls St., Falls Church, Virginia 1943
GAILLARD, STEPHEN LEE, 9 Lee Pl., Bronxville, New York 1941
GAINES, ARTHUR, 1 Wall Street, New York 5, New York 1952
GAINEY, LOUIS FRANKLIN, Box 299, Jupiter, Florida 1950
GAIRLOCH, STANLEY S[TANFORD], R. R. No. 2, N. Scituate, Rhode Island .. 1947
GALLEY, MRS. AUGUSTA R[ICHMOND] [MRS. E. J. G.], 4915 Cass St., Omaha, Nebraska 1949
GALLEY, JOHN E[DMOND], 1610 W. Holloway Ave., Midland, Texas 1949
GALLOWAY, LEO A[LDIS], Fullerton, Nebraska 1951
GALLUP, FRED[ERICK] N[ORMAN], Box 614, Escondido, California 1948
GAMBRILL, MRS. RICHARD V. [EDITH B], Vernon Manor, Peapack, New Jersey 1951
GAMERO, ANTONIO, 1837 N. Alexandria Ave., Hollywood 28, California .. 1953
GAMMELL, Ann M. [MRS. ROBERT T.], Kenmare, North Dakota 1952
GAMMELL, DR. ROBERT T., Kenmare, North Dakota 1942
GANDY, BENJAMIN E[RSKINE], 3440 Rosemary Ave., Jackson 9, Mississippi 1952
M GANIER, ALBERT F., 2112 Woodlawn Dr., Nashville, Tennessee ... (1917) 1934
GANTZ, R[OBERT] J. M., R. D. 2, Doylestown, Bucks County, Pennsylvania 1949
HL GARDINER, CHARLES BARNES, 133 W. Main St., Norwalk, Ohio 1903
GARDNER, ALFRED WILD, Box 44, Aspen, Colorado 1953
GARDNER, MERRIEL M[ASLIN] [MRS. I. C.], 9531 E. Stanhope Rd., Kensington, Maryland 1943
GARLAND, LEONARD J., 260–73 73rd Ave., Glen Oaks, Floral Park, Long Island, New York 1953
GARNER, WILLIAM V[AUGHN], 447 E. Wadsworth St., Philadelphia 19, Pennsylvania 1948

GARRETT, [MARY] LOIS, 1709 Chestnut St., Kenova, West Virginia..... 1949
GARRISON, DAVID L[LOYD], Old Lexington Road, Lincoln, Massachusetts 1949
GARRISON, ROBERT C[HARLES], Box 105, Bonita Springs, Florida..... 1950
GARRITY, DEVIN A[DAIR], 682 Forest Ave., Rye, New York..... 1947
GARVAN, MRS. FRANCIS P., 740 Park Ave., New York 21, New York.... 1948
GARY, W[ILBUR] Y[OCUM], P. O. Box 1791, Jacksonville 1, Florida..... 1950
GASHWILER, JAY S., U. S. Fish and Wildlife Service, 218 Pioneer Post Office Building, Portland 4, Oregon..... 1939
GASPAREC, SAMUEL, Box 88, Homer, Alaska..... 1953
GATES, DORIS, 401 S. Ash, North Platte, Nebraska..... 1952
GATES, FRANK WARD R[ISDON], 156 Garfield Rd., West Hartford 7, Connecticut..... 1928
GAULT, MRS. LYNN [LUCILE DRAPER], Brasstown, North Carolina..... 1952
L GAUNTLETT, FREDERIC JOHN, 5802 Kirkside Dr., Chevy Chase 15, Maryland 1925
GEALE, MR. B[EVERLEY] B., 109 Glenview Ave., Toronto, Ontario, Canada 1952
GEIS, AELRED D[EAN], 429 C. Hawthorne Lane, East Lansing, Michigan.. 1952
GELATIS, MRS. LEE H. [LILLIAN R.], 234 S. Maple Ave., Apartment G–1, Oak Park, Illinois..... 1952
GEMBOL, ROBERT V[ANCE], 3128 8th St., Columbus, Nebraska..... 1952
GENELLY, RICHARD E., 3392 Ridge Rd., Lafayette, California..... 1952
GENSCH, ROBERT H[ENRY], 105 Clark Ave., Billings, Montana..... 1938
GEORGE, DR. JOHN L[OTHAR], Division of Conservation, Vassar College, Poughkeepsie, New York..... 1950
GERSTELL, RICHARD, 355 N. West End Ave., Lancaster, Pennsylvania.... 1939
GIBBS, HAROLD N., A–71 Sowams Rd., Barrington, Rhode Island..... 1939
GIBBS, ROBERT HENRY, JR., 414 Stewart Ave., Ithaca, New York..... 1947
GIBSON, ROBERT H[OWARD], R. R. 2, Box 336, St. Helena, California.... 1948
GIER, DR. HERSCHEL T[HOMAS], Department of Zoology, Kansas State College, Manhattan, Kansas..... 1937
GIESLER, J[OHN] CALVIN, R. F. D. 2, Box 154, Payette, Idaho..... 1950
GIFFORD, DR. HAROLD, 3636 Burt St., Omaha 3, Nebraska..... 1946
GIFT, ROBERT F[RANKLIN], 935 Washington Ave., Lewisburg, Pennsylvania..... 1950
GILBERT, DR. PERRY W[EBSTER], Zoology Department, Cornell University, McGraw Hall, Ithaca, New York..... 1939
GILES, LESTER A[LSBRA], JR., 16 "D" Weis Road, Albany 8, New York. 1953
GILES, NORMAN H[ENRY], JR., Osborn Botanical Laboratory, Yale University, New Haven, Connecticut..... 1930
GILL, GEOFFREY, 24 Overlook Dr., Huntington, Long Island, New York.. 1940
GILLEN, HAROLD W., c/o Gillen and Co., 120 Broadway, New York 5, New York..... 1950
GILLESPIE, MRS. HAROLD S[HALOR] [MARJORIE K.], 655 Church St., Bound Brook, New Jersey..... 1951
M GILLIARD, E[RNEST] THOMAS, American Museum of Natural History, 79th St. and Central Park West, New York 24, New York.....(1938) 1950
GIRLING, WILLIAM G., R. R. No. 1, Wilton Grove, Ontario, Canada..... 1952
GLASGOW, CHARLES A[LFRED], 2421 First Ave., Edgely, Bristol, Pennsylvania..... 1952
GLASGOW, LESLIE L., Louisiana State University, School of Forestry, Baton Rouge, Louisiana..... 1952

GLATFELTER, ALFRED E., Hampden DuBose Academy, Zellwood, Florida 1949
GLENN, ROBERT W[YCOFF], 509 Orchard Ave., Avalon, Pittsburgh 2, Pennsylvania ... 1937
GLENNY, FRED H., 1148 Linden Ave., Akron 10, Ohio ... 1947
GLICK, BRUCE, 2062 E. 17th Ave., S-30, Columbus, Ohio ... 1948
GLORE, W[ALTER] S[COTT], JR., Danville, Kentucky ... 1952
GLOVER, DR. FRED A., Division of Natural Science, Humboldt State College, Arcata, California ... 1945
GLOYD, DR. HOWARD K[AY], Chicago Academy of Sciences, 2001 N. Clark St., Chicago 14, Illinois ... 1939
GNANN, WALTER N., Bonnie Doon Plantation, R. F. D. No. 1, Box 106, Ridgeland, South Carolina ... 1953
M GODFREY, W[ILLIAM] EARL, National Museum of Canada, Ottawa, Ontario, Canada ... (1942) 1949
GOEBEL, HERMAN, 78-52 80th St., Brooklyn 27, New York ... 1947
GOELET, ROBERT G., 546 Fifth Ave., New York 36, New York ... 1952
GOELITZ, WALTER A[DOLPH], P. O. Box 58, Milford, Pennsylvania ... 1916
GOETHE, C. M., Capital National Bank Bldg., 7th and "J" Sts., Sacramento 14, California ... 1947
GOETZ, CHRISTIAN J[OHN], 3503 Middleton Ave., Cincinnati, Ohio ... 1929
GOLDMAN, LUTHER CHASE, Fish and Wildlife Service, San Benito, Texas ... 1947
GOLDSTEIN, HARRY B[ARUCH], 5939 Addison St., Philadelphia 43, Pennsylvania ... 1947
GOLDWASSER, MRS. MARTIN [PAULA N.], 24 Willow Street, Brooklyn 1, New York ... 1953
GOMER, EDGAR R., General Delivery, Dulce, New Mexico ... 1952
M GOOD, DR. ALBERT I., 819 Quinby Ave., Wooster, Ohio ... (1939) 1948
GOODEN, SAM[UEL] [KNAPP], 1222 Hunter St., Conway, Arkansas ... 1951
GOODMAN, DONALD C., 705 W. Main St., Urbana, Illinois ... 1953
GOODMAN, JEANNE MOORE, Department of Biology, University of Redlands, Redlands, California ... 1947
GOODPASTURE, KATHERINE ANDERSON, [MRS. ERNEST W.], 408 Fairfax Ave., Nashville 5, Tennessee ... 1950
GOODRIDGE, EDWIN T., Province Line Rd., Princeton, New Jersey ... 1946
GOODWILL, E. V., Hydrographic Service, Department of Mines and Technical Surveys, Ottawa, Ontario, Canada ... 1942
GOODWIN, CLIVE EDMUND, 38 Walsh Ave., Weston, Ontario, Canada ... 1952
GOODWIN, MARGARET S., Earnley, R. F. D. No. 5, West Chester, Pennsylvania ... 1942
GOODWIN, ROBERT E., 90 East St., Oneonta, New York ... 1952
GORDON, ALAN GEORGE, 15 Brookfield Rd., York Mills, Toronto, Ontario. Canada ... 1953
GORDON, DAVID C[HARLES], 1012 Indianapolis Ave., Riverside, California 1951
GORDON, HARRY E[DGAR], 307 Laburnum Crescent, Rochester, New York. 1911
GORDON, MALCOLM S[TEPHEN], 1305—53rd St., Brooklyn 19, New York ... 1952
GORDON, SETH E[DWIN], 926 "J" St., Sacramento, California ... 1924
GORSUCH, DAVID MAJOR, 1627 N. Maple, Tucson, Arizona ... 1952
GOSLIN, CHARLES R., 726 E. King St., Lancaster, Ohio ... 1936
GOTTSCH, WERNER, H[ENRY], 8110 Cargill, Houston 15, Texas ... 1948
GRABER, WILLIAM J[AMES] III, 695 Twentieth St., Beaumont, Texas ... 1951

GRACE, LUCILE C. [MRS. C. J.], Hilton's Rd., Slingerlands, New York... 1944
GRAFF, GEORGE S., 830 Jefferson St., St. Charles, Missouri..... 1951
GRAHAM, HATCH, JR., 10300 Viretta Lane, Los Angeles 24, California.... 1950
GRAHAM, HATCH, SR., 1106 Hall of Records, Los Angeles 12, California.. 1947
GRAHAM, DR. JOHN COOPER, 80 Hanson Place, Brooklyn 17, New York.... 1949
GRANGE, WALLACE, Sandhill Game Farm Inc., Babcock, Wisconsin..... 1923
GRANT, DR. ADELE LEWIS, 6019 S. Overhill Dr., Los Angeles 43, California 1947
GRANT, CLEVELAND P[UTNAM], 245 Davis St., Mineral Point, Wisconsin.. 1924
GRANT, ROBERT H., 2415 Newkirk Ave., Brooklyn 26, New York..... 1943
GRAYCE, ROBERT, 141 Main St., Rockport, Massachusetts..... 1947
GREELEY, FREDERICK, University Houses 15-B, Eagle Heights, Madison 5, Wisconsin..... 1937
L GREEN, MORRIS MILLER, 39 Wyoming Ave., Ardmore, Pennsylvania.... 1921
GREEN, WALON CHARLES, 341 S. Roxbury Dr., Beverly Hills, California.. 1951
M GREENE, EARLE ROSENBURY, 418 S. Holt Ave., Los Angeles 48, California (1921) 1942
GREENE, MRS. EARLE R., 418 S. Holt Ave., Los Angeles 48, California.... 1953
GREENE, DR. ROBERT A[LONZO], 11 Second St., Geneseo, New York..... 1948
GREENHALGH, CLIFTON M., P. O. Box 326, Murray, Utah..... 1944
GREENOUGH, MRS. CHESTER N., [RUTH H.], 10 Juniper Rd., Belmont 78, Massachusetts..... 1951
HL GREENOUGH, HENRY V[OSS], "Greenhold Farm," Maple St., Carlisle, Massachusetts..... 1901
GREENWALT, ERNEST J[AGGER], Wichita Mountains Wildlife Refuge, Cache, Oklahoma..... 1932
GREENWALT, LEON, P. O. Box 274, Goshen, Indiana..... 1949
F GREENWAY, JAMES COWAN, JR., Museum of Comparative Zoology, Cambridge 38, Massachusetts .....(1930) 1948
GREGORY, ROBERT, R. R. No. 1, Mooresville, Indiana..... 1947
M GREGORY, STEPHEN S[TRONG], Box N, Winnetka, Illinois.....(1906) 1934
GREGORY, TAPPAN, 105 S. La Salle St., Chicago, Illinois..... 1931
GRESHAM, HENRY L., 15 Fernwood Park, Rochester 9, New York..... 1947
GREY, REV. JOHN HUGH, JR., Box 445, Williamsburg, Virginia..... 1952
GRIFFEE, W. E., 580 Yeon Bldg., Portland 4, Oregon..... 1944
M GRIFFIN, DR. DONALD R[EDFIELD], Biological Laboratories, Harvard University, Cambridge 38, Massachusetts.....(1936)1947
GRIFFIN, WILLIAM W[ELCOME], 3232 Pine Ridge Rd. N., Atlanta, Georgia 1946
M GRIMES, SAMUEL ANDREW, 4627 Peachtree Circle E., Jacksonville, Florida (1925) 1951
GRIMM, FORREST C[RAVER], 52 Conway St., Carlisle, Pennsylvania..... 1951
GRIMM, WILLIAM C., Georgetown, South Carolina..... 1943
GRINNELL, HILDA WOOD, [MRS. JOSEPH], 3016 Benvenue Ave., Berkeley 5, California..... 1931
L GRINNELL, LAWRENCE I[RVING], 710 Triphammer Rd., Ithaca, New York 1938
F GRISCOM, LUDLOW, Museum of Comparative Zoology, Cambridge 38, Massachusetts.....(1908) 1925
GRISWOLD, JOHN AUGUSTUS, JR., The Zoological Society, 34th St. and Gerard Ave., Philadelphia 4, Pennsylvania..... 1933
GROESBECK, WILLIAM M[AYNARD], 376 Seneca Rd., Hornell, New York... 1949
GROFF, MISS FRANCES L[LOYD], Chester Heights, Pennsylvania..... 1929

M GROMME, OWEN J., Milwaukee Public Museum, Milwaukee, Wisconsin (1924) 1939
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GRUBE, GEORGE E[DWARD], Biology Department, Gettysburg College, Gettysburg, Pennsylvania 1943
GRUENEWALD, ROBERT F[RANKLIN], Clifton, Illinois 1948
GUDMUNDSSON, DR. FINNUR, Natturugripasafnid (Museum of Natural History), P. O. Box 532, Reykjavik, Iceland 1949
L GUERNSEY, RAYMOND G[ANO], Eden Terrace, Poughkeepsie, New York.. 1928
L GUILD, EASTHAM, Box 56, Papeete, Tahiti 1930
GULLION, GORDON W[RIGHT], 624 Avenue "I," Boulder City, Nevada.... 1946
GUMBART, WILLIAM B., 205 Church St., New Haven 9, Connecticut..... 1948
GUNDERSON, HARVEY L., Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota 1947
LM GUNN, W[ILLIAM] W[ALKER] H[AMILTON], 178 Glenview Ave., Toronto 12, Ontario, Canada .....(1935) 1951
GUNTER, DR. GORDON, Institute of Marine Science, Port Aransas, Texas.. 1948
GUTHRIE, DR. DONALD, Robert Packer Hospital, Sayre, Pennsylvania.... 1930
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M HAGAR, JOSEPH A[RCHIBALD], Marshfield Hills, Massachusetts....(1935) 1939
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HALL, WILLIS, 1111 Douglas Ave., Yankton, South Dakota 1948
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HARDY, FREDERICK C., 200½ Jasper St., Somerset, Kentucky..... 1949
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HLM HARPER, DR. FRANCIS, 115 Ridgway St., Mt. Holly, New Jersey..(1907) 1917
HARRINGTON, DR. PAUL, 813 Bathurst St., Toronto, Ontario, Canada.... 1922
HARRIOT, SAMUEL C[ARMAN], 200 W. 58th St., New York, New York.... 1934
HARRIS, DR. ARTHUR TREVENNING, 14256 Ventura Blvd., Sherman Oaks, California..... 1950
LM HARRIS, HARRY, 5234 Hermosa Ave., Eagle Rock, California.....(1911) 1919
HARRIS, LUCIEN, JR., 61 Clarendon Ave., Avondale Estates, Georgia.... 1930
HARRIS, ROBERT D., Canadian Wildlife Service, Dept. of Resources and Development, Ottawa, Ontario, Canada..... 1952
HARRIS, DR. STUART K[IMBALL], R. F. D. 4, Georgetown, Massachusetts 1940
HARRIS, WILLIAM GEO[RGE] F[OWLE], 147 Hillside St., Milton 86, Massachusetts..... 1933
L HARRIS, WILLIAM P[ICKETT], JR., 309 Rivard Blvd., Grosse Pointe 30, Michigan..... 1925
L HARRISON, ED N[EWTON], 1134 Glendon Ave., Los Angeles 27, California.. 1934
L HARRISON, GEO. L[EIB], 1128 Fidelity-Philadelphia Trust Bldg., 123 S. Broad St., Philadelphia 9, Pennsylvania..... 1919
HARRISON, HAL H., 1102 Highland St., Tarentum, Pennsylvania..... 1944
HARROWER, DR. D[AVID] E[LSON], Newton, Connecticut..... 1933
HART, W[ILLIAM] STEPHEN, 62, Forden Crescent, Westmount 6, P. Q., Canada..... 1926
HARTE, KEN, 45 Lawrence Rd., Scarsdale, New York..... 1952
HARTMAN, FRANK A[LEXANDER], Hamilton Hall, Ohio State University, Columbus, Ohio..... 1941
HARTSHORNE, CHARLES, 1224 E. 57th St., Chicago 37, Illinois..... 1951
HARTSHORNE, JAMES MOTT, c/o General Delivery, Jacksonville, North Carolina..... 1946
HARWELL, CHARLES ALBERT, 2630 Hilgard Ave., Berkeley, California.... 1943
HASBROUCK, DR. EDWIN M[ARBLE], 4909—14th, N. W., Washington, D. C. 1939
HASBROUCK, HENRY C[RANE], 88 Douglas Road, Glen Ridge, New Jersey 1920
HASTINGS, E[DWARD] EARNSHAW, 505 Oakley Rd., Haverford, Pennsylvania..... 1946
HATCH, [CLARA] GRENVILLE, 2007 A-Round Top Dr., Honolulu 14, Hawaii 1950
HATH, EARL HERBERT, 2109 Briar Gate Lane, Kirkwood 22, Missouri.... 1952
HL HAVEMEYER, H[ENRY] O[SBORNE], Mahwah, New Jersey..... 1893
HAWBECKER, ALBERT C., Fresno State College, Fresno, California..... 1947
HAWKINS, L[ESLIE], G., P. O. Box 1663, Los Alamos, New Mexico..... 1947
HAWKSLEY, OSCAR, Central Missouri State College, Warrensburg, Missouri..... 1943
HAYDOCK, EDWARD L[AURENCE], P. O. Box 267, Luanshya, Northern Rhodesia, Africa..... 1948
HAYMAN, ROBERT G[ENE], R. F. D. No. 1, Carey, Ohio..... 1951
HAYNE, DR. DON W[ILLIAM], Dept. of Zoology, Michigan State College, East Lansing, Michigan..... 1950
HAYNSWORTH, W[ILLIAM] F[RANCIS] B[AKER], 103 E. Calhoun St., Sumter, South Carolina..... 1950
HAYS, EVA H., 11 Dorman Rd., Morningside, Wheeling, West Virginia.. 1944
HEALY, JOSEPH F[RANCIS], 3520 N. Paulina St., Chicago 13, Illinois..... 1950
HEAPS, MISS PEARL, 1916 Park Ave., Baltimore 17, Maryland..... 1948
HEATH, REGINALD, 10532—128 St., Edmonton, Alberta, Canada..... 1950

M HEBARD, FREDERICK V[ANUXEM], 1500 Walnut St. Bldg., Philadelphia, Pennsylvania ..... (1930) 1951
HEBDITCH, G[ERALD] A[UBREY], 92 Rydes Hill Rd., Guildford, Surrey, England 1949
HECKLER, SYDNEY B., 1207 N. 7th St., St. Louis 6, Missouri 1948
HECKSCHER, STEVENS, 55 Sacramento St., Cambridge 38, Massachusetts .. 1952
HEDGES, HAROLD C[HARLES], R. R. 2, Quivira Lake, Kansas City 3, Kansas 1946
HEDGPETH, JOEL T[HOMAS], 1201—29th Ave., San Francisco 22, California 1953
HEED, WILLIAM B[ATTLES], Department of Zoology, University of Texas, Austin, Texas 1945
HEFLEY, HAROLD M[ARTIN], Division of Biological Sciences, Mississippi Southern College, Station A., Hattiesburg, Mississippi 1947
HEGNER, FRANK ARNOLD, 727 Broad St., Sewickley, Pennsylvania 1924
HEILBORN, [KLAUS] AXEL, 1020 Creekside Dr., Niagara Falls, New York .. 1949
HEISER, JOSEPH M[ATHEW], JR., 1724 Kipling St., Houston 6, Texas 1939
HEISER, MISS MINNIE, 2611 Elisha Ave., Zion, Illinois 1947
HELFER, MISS LOUISE, 111—9th St., Watkins Glen, New York 1929
HELLEINER, FREDERICK M., Box 14, Swastika, Ontario, Canada 1947
HELMS, CARL W., 336 W. Evers Ave., Bowling Green, Ohio 1952
HENDERSON, MRS. ALEXANDER, 337 Aycrigg Ave., Passaic, New Jersey .. 1946
HENDERSON, ARCHIBALD DOUGLAS, Belvedere, Alberta, Canada 1949
HENDERSON, MRS. WILLIAM L., Gibson Island, Maryland 1953
HENDRICKS, GENE THOMPSON [MRS. PHILIP], 900 S. Robberson Ave., c/o C. E. Thompson, Springfield 4, Missouri 1947
HENDRICKSON, DR. GEORGE O[SCAR], Department of Zoology and Entomology, Science Hall, Iowa State College, Ames, Iowa 1943
HENNESSY, WESLEY J., Department of Engineering, Columbia University, New York 27, New York 1952
HENNEY, MRS. NELLA B[RADDY], 111 Fifth St., Garden City, New York .. 1950
HENNINGSON, MRS. LILLIAN, 124 Cambridge Way, Piedmont 11, California 1953
HENSLEY, M[ARVIN] MAX, Department of Biology, Gettysburg College, Gettysburg, Pennsylvania 1949
HENRY, CORDIA J[OHN], Seney National Wildlife Refuge, Germfask, Michigan 1934
HENWOOD, MRS. ETHEL M., 806 S. Lincoln, Urbana, Illinois 1947
HERBERT, RICHARD A., 961 Fox St., Bronx 59, New York City, New York 1946
HERMAN, DR. CARLTON M[ARTIN], Patuxent Research Refuge, Laurel, Maryland 1951
HERMES, ROBERT C[ARLYLE], 205 N. Park Ave., Buffalo 16, New York 1949
HERNDON, LEE R., 1533 Burgie Pl., Elizabethton, Tennessee 1946
M HERSEY, F[RANK] SEYMOUR, Bay Rd., Easton, Massachusetts ..... (1911) 1916
HERSHEY, MISS CLARA L[OUISE], 168 Lincoln St., Steelton, Pennsylvania .. 1937
HESSER, ERNEST F., 112 S. 5th St., Walla Walla, Washington 1952
HEWITT, DR. OLIVER H[AROLD], Dept. of Conservation, Fernow Hall, Cornell University, Ithaca, New York 1944
HEYWOOD, PHILIP B., 332 Main St., Worcester 8, Massachusetts 1947
L HIBBERT, MRS. HAROLD, Bettws-Y-Coed, Yarrow St., Bryn Mawr, Pennsylvania 1926
M HICKEY, DR. JOSEPH J[AMES], 424 University Farm Place, Madison 5, Wisconsin ..... (1936) 1940

M HICKEY, MARGARET BROOKS [MRS. JOSEPH JAMES], 5517 Dorsett Dr., Madison 5, Wisconsin.....(1933) 1952
HICKMAN, MRS. HERBERT AUSTIN, 2 Lexington Ave., Buffalo 22, New York..... 1947
LF HICKS, DR. LAWRENCE EMERSON, 8 Chatham Rd., Columbus 2, Ohio (1929) 1941
L HICKS, THOMAS W[ILLIAM], Apt. 204-C, Flavet Village III, Gainesville, Florida..... 1948
HIGGINS, HAROLD G., 2965 S. 14th East, Salt Lake City, Utah..... 1943
HIGGINS, THOMAS F., Box 85, Williston Pl., Long Island New York.... 1947
HIGHLEY, SEWARD T[RAINER], 43 Powder House Rd., Medford 55, Massachusetts..... 1953
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HILDEBRAND, RICHARD D., Box 521, Del Rio, Texas..... 1950
L HILDRETH, MISS MARY A., Park St., Haverhill, New Hampshire..... 1947
HILL, DR. HAROLD M[ERRILL], 14 Clifton Ct., Redlands, California..... 1947
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L HILL, JULIAN W[ERNER], 1106 Greenhill Ave., Wilmington, Delaware.. 1934
HILL, DR. NORMAN P[EIRCE], 2308 Highland Ave., Fall River, Massachusetts..... 1943
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HINCHMAN, RICHARD M[AY], 75 Fairbanks Rd., Milton 86, Massachusetts 1930
HINDS, FRANK J., Dept. of Biology, Western State Teachers College, Kalamazoo, Michigan..... 1935
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LM HOCHBAUM, HANS ALBERT, Delta, Manitoba, Canada.....(1942) 1946
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HODELL, ADAH R[IFE], 2026 Ponce de Leon Ave., West Palm Beach, Florida..... 1949
HODGE, DR. GEORGE E[SPLIN], 53 Belvedere Circle, Westmount, Montreal, Canada..... 1951
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HOLCOMBE, ALEXANDER H., JR., 2222 Arch St., Philadelphia 3, Pennsylvania 1949
HOLDEN, FENN M[ITCHELL], Box 428, Grayling, Michigan 1952
HOLDOM, CANON M[ARTIN] W[EBBER], Lindsay Cottage, Crescent Beach, British Columbia, Canada 1950
HOLLAND, HAROLD MAY, Box 615, Galesburg, Illinois 1910
HOLLERITH, RICHARD, 307 Shrewsbury Rd., Riverton, New Jersey 1946
HOLLIWAY, MRS. BESSIE HELEN, Rockport, Missouri 1953
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HOPKINS, MILTON N[EWTON], JR., 202 W. Roanoke Dr., Fitzgerald, Georgia 1950
HORSEY, R[ICHARD] E[DGAR], 320 Eaglehead Rd., East Rochester, New York 1919
HORSKY, L[EWIS] O[TTO], 1701 North 60th Street, Omaha 4, Nebraska ... 1948
HOUGH, JOHN N[EWBOLD], 1515 Mariposa, Boulder, Colorado 1946
L HOUSTON, C[LARENCE] STUART, Box 279, Yorkton, Saskatchewan, Canada 1943
F HOWARD, DR. HILDEGARDE, [MRS. H. ANSON WYLDE], Los Angeles County Museum, Exposition Park, Los Angeles 7, California ..... (1928) 1946
HOWE, H[ENRY] BRANCH, JR., 423 N. Pinckney St., Apt. 3-B, Madison, Wisconsin 1943
LM HOWELL, A[LFRED] BRAZIER, Alna, Maine ..... (1909) 1922
M HOWELL, DR. JOSEPH C[ORWIN], Zoology and Entomology Department, University of Tennessee, Knoxville, Tennessee ..... (1928) 1949
HOWELL, THELMA, Wesleyan College, Macon, Georgia 1947
HOWELL, DR. THOMAS R[AYMOND], Department of Zoology, University of California, Los Angeles 24, California 1948
HOWES, PAUL GRISWOLD, The Bruce Museum, Bruce Park, Greenwich, Connecticut 1951
HOWSLEY, L[UCIEN] R[EEDER], Simpson Lane, Fort Bragg, California 1950
HOY, NELSON D., 500 Sharon Ave., Sharon Hill, Pennsylvania 1943
HOYT, SARAH FORESMAN [MRS. J. SOUTHGATE Y.], Fernow Hall, Cornell University, Ithaca, New York 1940
HUBBARD, FRED H., Spring Prairie Parsonage, Morrisonville, Wisconsin .. 1952
HUBBS, DR. CARL L., Scripps Institution of Oceanography, La Jolla, California 1947
HUBBS, EARL LEAVITT, 3017 Wheeler, Berkeley 5, California 1948
HUBERT, PHILIP A[RTHUR], JR., P. O. Box 618, Bellport, Long Island, New York 1949

M Hudson, Dr. George E[lford], 303 Side St., Pullman, Washington. (1928) 1948
Huenecke, Howard S., Des Lacs National Wildlife Refuge, Kenmare, North Dakota 1952
M Huey, Laurence M., Natural History Museum, Balboa Park, San Diego, California ..... (1920) 1932
Huff, N. L., 1219—7th St., S. E., Minneapolis 14, Minnesota 1924
Hughes, Dr. S[helby] B[ond], 521 E. Jefferson St., Clinton, Missouri .. 1949
Hughes, Wallace, 624 S. W. 51st St., Oklahoma City, Oklahoma 1947
Hulbert, Lloyd [Clair], Botany Department, University of Minnesota, Minneapolis 14, Minnesota 1939
Hulsizer, William Hill, 5611 Jones St., Omaha 6, Nebraska 1952
Humphrey, James [Rae], 3495 W. 30th Ave., Denver 11, Colorado 1949
Humphrey, Philip Strong, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1947
Hundley, Marion L., 155 Third St., S. E., Carrollton, Ohio 1951
Hungerford, Dr. Kenneth E., School of Forestry, University of Idaho, Moscow, Idaho 1946
HL Hunn, John T[ownsend] S[harpless], 1218 Prospect Ave., Plainfield, New Jersey 1895
Hunnewell, Miss Louisa, 848 Washington St., Wellesley, Massachusetts 1936
Hunt, Dr. Gerald Marshall, 3911 Alicia Dr., San Diego 7, California .. 1952
Hunt, Miss Helen C[ummings], Washington, Connecticut 1928
Hunt, Richard Allen, Rt. 1, McFarland, Wisconsin 1953
Hunt, Mrs. William L[uther], 709 14th St., S. E., Washington 3, D. C. 1950
Hunter, Raymond H[arrison], Box 7, Roswell, New Mexico 1952
Huntington, Charles E[llsworth], Department of Biology, Bowdoin College, Brunswick, Maine 1949
Hurlbutt, Miss Catherine A., 1910 South Marion St., Denver 10, Colorado 1947
Hurley, John Beatty, 401 S. 17th Ave., Yakima, Washington 1946
Hurrie, David, Apt. 8C, Devonshire Apts., Brockville, Ontario, Canada 1952
Hutchinson, Arthur E[mlen], 2640 Glendessary Lane, Santa Barbara, California 1940
Hutchinson, Elverta G[raves], R. R. No. 4, Box 176, Loveland, Ohio .. 1951
Hutt, Dr. F[rederich] B[ruce], Department of Poultry Husbandry, Rice Hall, Cornell University, Ithaca, New York 1932
I. Huyler, Coulter D[unham], Dewees Island via Charleston, South Carolina 1928
Ijams, H[enry] P[earle], Route 9, Knoxville, Tennessee 1922
Imhof, Thomas A[nthony], 307—38 St., Fairfield, Alabama 1947
HL Ingersoll, Albert Mills, 908 F. St., San Diego, California 1885
Ingle, Mrs. Gertrude [Mussell], Miller Place, Long Island, New York 1950
Ingles, Dr. Lloyd Glenn, Fresno State College, Fresno, California 1947
Ingraham, Edward A[ndrews], 164 Montague St., Brooklyn, New York 1930
Irving, J[ames] Gordon, 631 Albin St., Teaneck, New Jersey 1943
Irving, Mrs. William Gary, Van Houten Fields, West Nyack, New York 1947
Isham, Henry W[are], 460 Bellefontaine St., Pasadena 2, California 1949
Ivor, H. Roy, R. R. No. 1, Cooksville, Ontario, Canada 1947
Jackson, C[icero] F[loyd], University of New Hampshire, Durham, New Hampshire 1936

HL JACKSON, DR. HARTLEY H[ARRARD] T[HOMPSON], Room 61, U. S. National Museum, Washington 25, D. C. 1910
JACKSON, MORRIS N., R. R. No. 1, Fanny Bay, British Columbia, Canada 1952
JACKSON, WILLIAM BRUCE, Fly Control Project, CDC, Sky Harbor Airport, 2418 E. Buchanan, Phoenix, Arizona 1951
JACOBS, E. BRYAN, Waynesburg, Pennsylvania 1940
JACOBSON, DR. MALCOLM ARTHUR, 13 W. 36th St., New York 19, New York 1947
JAEGER, EDMUND C[ARROLL], Riverside College, Riverside, California 1947
JAHN, FRANCES FLOED [MRS. THEODORE], 10241 Chrysanthemum Lane, Los Angeles 24, California 1947
JAMES, DOUGLAS A[RTHUR], Department of Zoology, University of Arkansas, Fayetteville, Arkansas 1946
JAMES, MRS. MABEL F., R. R. No. 1, Brownington, Missouri 1953
JAMES, DR. PAULINE, 912 W. Yoakum St., Kingsville, Texas 1953
JANSSEN, ROBERT B., 5128 Indianola Ave., Minneapolis 10, Minnesota ... 1949
JANVRIN, DR. E[DMUND] R[ANDOLPH] P[EASLEE], 38 E. 85th St., New York, New York 1919
M JAQUES, F[RANCIS] L[EE], E. Oaks Rd., North Oaks Farm, St. Paul 13, Minnesota ..... (1924) 1934
JAQUITH, BARBARA E[LIZABETH] [MRS. L. EVERETT], 84 Poplar Plains Crescent, Toronto, Ontario, Canada 1940
JASSE, ROBERT F[RANCIS], 180 Revere Beach Parkway, Revere 51, Massachusetts 1951
JEFFRESS, ROBERT M[ILLER], 1800 Monument Ave., Richmond 20, Virginia 1949
JEHL, JOZEPH R[EIHER], JR., 385 Grove St., Clifton, New Jersey 1952
JENKINS, ALLSTON, 1500 Walnut St., Philadelphia 2, Pennsylvania 1952
JENKINS, JAMES H[OBART], School of Forestry, University of Georgia, Athens, Georgia 1941
JENKINS, LLOYD [SMITH], Davis Hill Rd., Paxton, Massachusetts 1932
L JENKINS, DR. W[ILLIAM] J[ONES], P. O. Box 7, Olanta, South Carolina (1949) 1951
JENKS, RANDOLPH, 2146 E. 4th St., Tucson, Arizona 1928
JENNER, WILLIAM A[LEXANDER], 3426 78th Pl., S. E., Washington 28, D. C. 1932
JENNINGS, WILLIAM S[ELDEN], Box 134, Harlingen, Texas 1949
JENSEN, G[RANT] HORTIN, P. O. Box 603, Brigham City, Utah 1948
L JETER, HORACE HEARNE, 4534 Fairfield Ave., Shreveport 55, Louisiana .. 1946
F JEWETT, STANLEY G[ORDON], 1404 S. E. Bidwell St., Portland 2, Oregon (1906) 1940
L JOHNSON, CHARLES ALFRED, c/o Colorado Museum of Natural History, Denver, Colorado 1927
JOHNSON, DANIEL P[AIGE], Cape Cod Council, Inc., 147 Winter St., Hyannis, Massachusetts 1951
JOHNSON, DONALD H., 818 N. Garnsey, Santa Ana, California 1953
JOHNSON, ERNEST H[ILDING], 34 Wood St., Woodville, Massachusetts 1952
JOHNSON, H[AROLD] V[ICTOR], 927 W. Broadway, Eugene, Oregon 1947
JOHNSON, HARRIS E[LMER], R. R. No. 1, Warren, Pennsylvania 1949
JOHNSON, MRS. HERBERT R[AY], 137 Engle St., Tenafly, New Jersey 1950
JOHNSON, H[UGH] P[HILIP] H[EWITT], Knutsford, Oak End Way, West Byfleet, Surrey, England 1950
JOHNSON, JOHN C[HRISTOPHER], JR., Department of Zoology, University of Oklahoma, Norman, Oklahoma 1953

JOHNSON, JOHN O., 112 Seventh St., S. E., Watertown, South Dakota.... 1952
L JOHNSON, DR. MURRAY L[EATHERS], 3810 N. 35th St., Tacoma 7, Washington.... 1935
JOHNSON, NEW KEITH, 624 Lake St., Reno, Nevada.... 1953
JOHNSON, PERRY F[RANK], 670 Bell Ave., Elyria, Ohio.... 1937
JOHNSON, RAYMOND EDGAR, Lands and Surveys Department, 31 St. Vincent Street, Port of Spain, Trinidad, British West Indies.... 1945
M JOHNSON, DR. R[OBERT] A[NTHONY], 98 East St., Oneonta, New York (1930) 1946
JOHNSTON, DAVID WARE, Museum of Vertebrate Zoology, Berkeley 4, California.... 1947
JOHNSTON, IRMA K., Box 206, Huntington, New York.... 1949
JOHNSTON, RICHARD F[OURNESS], Museum of Vertebrate Zoology, Berkeley 4, California.... 1951
JOHNSTON, W[ARREN] F[REDERICK], 634 Goulding St., Winnipeg, Manitoba, Canada.... 1952
JONES, DUVALL A[LBERT], 8227 Philadelphia Rd., Baltimore 6, Maryland 1952
JONES, F[RED] M[INSON], Box 1864, Williamsburg, Virginia.... 1931
JONES, DR. GORDON, W[ILLIS], Ellwood Farms, Parker, Virginia.... 1933
JONES, HAROLD CHARLES, Box 61, East Carolina College, Greenville, North Carolina.... 1946
JONES, J. LEWIS, 859 Linden Ave., Shreveport, Louisiana.... 1952
JONES, JOHN C[OURTS], Wildlife Research Center, 5810 Namakagan Rd., Washington 16, D. C.... 1930
JONES, JOHN PAUL, 2715—50th St., Des Moines 10, Iowa.... 1948
JONES, MARLIN CHARLES, Box 73, Rupert, Idaho.... 1953
JONES, S[OLOMON] PAUL, 509 West Ave., North, Waukesha, Wisconsin.... 1920
L JOOST, DR. ARTHUR MARTIN, JR., Bucksport, Maine.... 1942
JOPSON, HARRY G[ORGAS] M[ICHENER], Bridgewater College, Bridgewater, Virginia.... 1949
JORAE, IRENE F., Central Michigan College of Education, Mt. Pleasant, Michigan.... 1947
JOSELYN, GEORGE BLAIR, Randolph, Nebraska.... 1953
JOSLIN, CHARLES H[ANKS], P. O. Box 1046, Port Orchard, Washington... 1949
JOYNER, J[OHN] W[ILLIAM] E[DWIN], 1504 Lindy Ave., Rocky Mount, North Carolina.... 1947
JUBON, JOHN M[ATHEW], P. O. Box 16, East Millstone, New Jersey.... 1952
JUDD, ROBERT S., 75 Old Farm Rd., New Haven, Connecticut.... 1948
JUNG, CLARENCE S[CHRAM], 6383 North Port Washington Rd., Milwaukee 11, Wisconsin.... 1921
JURICA, REV. EDMUND, St. Procopius College, Lisle, Illinois.... 1946
JUSTIN, REV. BROTHER, M. s. g., 1655 Bld. Gouin East, Montreal 12, Quebec, Canada.... 1951
KAERNE, WILLIAM H[AROLD], P. O. Box 176, Winnipeg, Manitoba, Canada 1949
KAHL, [MARVIN] PHILIP, JR., 122 E. 47th St., Indianapolis, Indiana.... 1952
KAIMAN, BERNARD D[AVID], 814 Salzedo St., Coral Gables, Florida.... 1950
F KALMBACH, E[DWIN] R[ICHARD], 2654 Forest St., Denver, Colorado..(1910) 1927
KASE, JOHN C[HARLES], 501 Chestnut St., Mifflinburg, Pennsylvania.... 1949
KASPAR, JOHN L[OREN], 392—23rd St., Oshkosh, Wisconsin.... 1948
KAUFMAN, KATHERINE, Freeman, South Dakota.... 1952

KEATING, DR. F[RANCIS] RAYMOND, JR., 620 Tenth Ave., S. W., Rochester, Minnesota 1941
HL KEAYS, JAMES EDWARD, 328 St. George St., London, Ontario, Canada.. 1899
KEELER, JAMES E., 3576 Georgetown Dr., Montgomery, Alabama 1952
KEETON, LUTHER F., 80 Eastland Drive, Memphis, Tennessee 1945
KEIM, FRANK T., 196 Divadale Drive, Leaside, Ontario, Canada 1952
KEITH, LLOYD BURROWS, 9306 89th St., Edmonton, Alberta, Canada 1953
KELLER, RICHARD T., 717 S. 16th St., St. Joseph 36, Missouri 1947
KELLEY, MRS. ELIZ MABEL, 79 Tilden Ave., Newport, Rhode Island 1951
KELLEY, NEIL T[HOMAS], 13137 Balfour Rd., Huntington Woods, Michigan 1951
KELLOGG, JULIET RICHARDSON, [MRS. WATERS], 19 Oneida St., Rye, New York 1937
M KELLOGG, DR. [PETER] PAUL, 115 Dearborn Pl., Ithaca, New York..(1929) 1939
KELLY, ALFRED W[ILLIAM] B[UCHANAN], 2177 Lincoln Ave., Apt. 12A, Montreal, Quebec, Canada 1951
KELLY, DR. JOAN M[ORTON], 352 Nautilus St., La Jolla, California 1952
LM KELLY, JUNEA W[ANGEMAN] [MRS. GEORGE EARLE], 1311 Grand St., Alameda, California ..... (1929) 1949
KELLY, VIRGIL [FRANKLIN], JR., 212 Highland Ave., Fayetteville, North Carolina 1949
KELSO, LEON [HUGH], 1370 Taylor St., N. W., Washington, D. C. 1929
KEMNITZER, ALLEN E[DWARD], 969 Five Mile Line Rd., Webster, New York 1949
KEMSIES, EMERSON, 102 Farragut Rd., Greenhills 18, Ohio 1949
KENAGA, CLARE B[URTON], 201-B Hickory Lane, East Lansing, Michigan 1952
KENAGA, EUGENE E., 1629 Isabella Rd., Rt. 5, Midland, Michigan 1949
LF KENDEIGH, DR. S. CHARLES, Vivarium Bldg., University of Illinois, Champaign, Illinois ..... (1923) 1943
KENT, LAWRENCE C., 1896 Cowden Ave., Memphis 4, Tennessee 1946
KENYON, G[EORGE] PAUL, Box 172, 260 Crittenden Blvd., Rochester 20, New York 1952
KENYON, JAMES A[NTHONY], 417 Third Ave., Lewiston, Idaho 1946
KENYON, KARL WALTON, 2725 Montlake Blvd., Seattle 2, Washington.. 1944
KERSTING, CECIL C[ARL], Socony-Vacuum of Venezuela, Apartado 246, Caracas, Venezuela 1949
KESNER, ROBERT T[AYLOR], 1 River Glen, Hastings-on-Hudson, New York 1952
KESSEL, DR. BRINA, Department of Biological Sciences, University of Alaska, College, Alaska 1948
KEY, MISS KATHLEEN, Department of Biology, Louisiana State College, Pineville, Louisiana 1953
KIEFER, BARRY I[RWIN], 866 Broadway, Bayonne, New Jersey 1953
KIERAN, JOHN, 1360 Midland Ave., Bronxville 8, New York 1947
KILDOW, T[HOMAS MONROE], Box 520, Tiffin, Ohio 1942
HL KILGORE, WILLIAM, 3400 List Place, Minneapolis, Minnesota 1906
KILHAM, DR. LAWRENCE, 8302 Garfield St., Bethesda, Maryland 1952
KILLPACK, MERLIN L[EO], Union High School, Roosevelt, Utah 1949
KIMBALL, MARY B[OYDSTON], 809 Main St., Sistersville, West Virginia.. 1952
KINCAID, EDGAR B[RYAN], JR., 702 Park Place, Austin, Texas 1953
KINCH, CAROL M., 906 N. Grant St., Lexington, Nebraska 1952
KING, JAMES R[OGER], Department of Zoology, State College of Washington, Pullman, Washington 1952

KINGERY, HUGH E[PPICH], 2350 Colorado Blvd., Denver 7, Colorado.... 1949
KINNEY, MRS. WARREN, Box 9, Morristown, New Jersey..... 1951
KINGSBURY, DR. MARGUERITE, Sunmount, New York..... 1950
KINSEY, ERIC CAMPBELL, 155 Bothin Rd., P. O. Box 76, Manor, Marin County, California..... 1936
KINSLEY, C[HARLES] H[ARWOOD], Room 1, Agriculture Bldg., Embarcadero at Mission St., San Francisco 5, California..... 1949
L KIRKHAM, STANTON D[AVIS], 152 Howell St., Canandaigua, New York.... 1910
KIRKPATRICK, DR. J[OYCE] T[AYLOR], 224½ Main St., Slater, Missouri.... 1948
KITCHEN, HERMAN W., 502 W. 122nd St., New York 27, New York..... 1952
KLABUNDE, WALTER, Creek Rd. Ext., R. F. D. 1, Lewiston, New York.... 1949
KLEEN, RICHARD L., Box 122, St. Michaels, Maryland..... 1953
KLEIN, RICHARD P., 23108 E. Groveland Rd., Cleveland 21, Ohio..... 1947
KLEPFER, WARD, 169 Morris Ave., Buffalo 14, New York..... 1940
KLONICK, ALLAN S., 828 Grosvenor Rd., Rochester 18, New York..... 1938
KLOPP, JOHN, Vinemont, Reinholds, Pennsylvania..... 1953
KLOPPENBORG, ALBERT BLAINE, 901 E. 7th St., N., Newton, Iowa..... 1953
KNAPP, W[ILFRID] A[RTHUR], 363 Blythwood Rd., Toronto 12, Ontario, Canada..... 1950
KNICKMEYER, ROBERT R., 8627 North Ave., St. Louis 21, Missouri..... 1946
KNIGHT, HOWARD, Weber College, Ogden, Utah..... 1949
KNODER, CECIL EUGENE, Rt. 5, Athens, Ohio..... 1952
KNORR, OWEN A[LBERT], Rt. 1, Box 53, Boulder, Colorado..... 1949
KNOX, MISS MARGARET R[ICHARDSON], 4030 Park Ave., Indianapolis 5, Indiana..... 1941
KNUDSEN, MR. HOLGER, 507 Parkside Dr., Toronto 3, Ontario..... 1953
KOBAYASHI, KEISUKE, No. 2, 1-Chome, Shinohara-Kitamachi, Nada-Ku, Kobe (Rokko), Japan..... 1951
KOCH, PETER, Big Bend National Park, Texas..... 1940
KOFORD, DR. CARL B., Museum of Vertebrate Zoology, Berkeley 4, California..... 1942
KOLB, C[HARLES] HAVEN, 5915 Meadow Rd., Baltimore 6, Maryland.... 1937
KORTHEUER, H[ERMANN] FRANCIS, R. R. No. 2, Falls Village, Connecticut 1950
LM KORTRIGHT, FRANCIS HERBERT, 633 Eastern Ave., Toronto, Ontario, Canada.....(1942) 1945
KOSMOPOULOS, LESLIE WALKER, 2024 Garden St., Santa Barbara, California..... 1948
KOSSACK, CHARLES W., 715 S. Division St., Barrington, Illinois..... 1946
KOZICKY, EDWARD LOUIS, Wildlife Research Unit, Department of Zoology and Entomology, Iowa State College, Ames, Iowa..... 1947
KRAMER, QUINTIN, 872 Ledger Bldg., Philadelphia 6, Pennsylvania..... 1946
KRAUS, DR. DOUGLAS L[AWRENCE], Department of Chemistry, University of Rhode Island, Kingston, Rhode Island..... 1940
KREBS, R[OBERT] W[ILLIAM], 1272 Alfred St., Baton Rouge, Louisiana.. 1952
KREHBIEL, A[DOLF] J[ACOB], 221 Jefferson St., Clayton, New Mexico.... 1949
KRIEBEL, MAHLON E., Garfield, Washington..... 1953
KRUG, HOWARD H[ENRY], Chesley, Ontario, Canada..... 1932
KRUMM, KENNETH, Lacreek National Wildlife Refuge, Martin, South Dakota..... 1938
M KUBICHEK, WESLEY FRANK, Fish and Wildlife Service, Department of the Interior, Washington, D. C.....(1919) 1939

KUENZLER, EDWARD JULIAN, JR., Department of Biology, University of Georgia, Athens, Georgia 1953
KUNKLE, DONALD [EDWARD], 29 Edgewood Rd., Bloomfield, New Jersey.. 1950
KUSCHKE, ARTHUR WYNDHAM, JR., 522 Kingston Rd., Oreland, Pennsylvania 1935
KUSER, MRS. CYNTHIA D., Faircourt, Bernardsville, New Jersey..... 1931
KYLLINGSTAD, HENRY C[ARREL], Arab States Fundamental Education Center, Sirs-el-Layyan, Menoufia, Egypt..... 1947
LABELLE, GEORGE A., Cocagne, New Brunswick, Canada..... 1939
LACY, MRS. TRAMMELL C[ALHOUN], Drawer 2, North Street Station, Nacogdoches, Texas..... 1953
LAFITTE, MRS. OLNEY J., Box 783, Mansfield, Louisiana..... 1953
LAGERLOF, SVEN CHRISTIAN, Tingshuset, Boden, Sweden..... 1952
LAIDLAW, ANNE, 32 North Sherbourne St., Toronto, Ontario, Canada.... 1953
M LAING, HAMILTON MACK, Comox P. O., British Columbia.....(1917) 1941
LAKE, GEORGE D., Audreys, Burghfield Common, Reading, England.... 1941
LAMB, CHESTER C., Escobedo 69, Irapuato, Guanajuato, Mexico..... 1943
LAMM, DONALD W., American Consulate General, Box 783, Lourenco Marques, Mozambique, Africa..... 1941
LAMPE, M[ONTGOMERY] L[EWIS], 21 W. Roseville Rd., Lancaster, Pennsylvania 1949
LANCASTER, DOUGLAS A[LAN], 1332 5th St. N., Fargo, North Dakota..... 1949
LANCELEY, W. H., 23 Elmdale Avenue, Ottawa, Ontario, Canada..... 1926
LANDRY, PETER, R. R. 2, Port Hope, Ontario, Canada..... 1953
LANG, EDWARD B., Brushy Hill Rd., Newton, Connecticut..... 1943
LANGELIER, MRS. GUS[TAVE] [ADOLPHE], 95 de l'Entente Boulevard, Quebec, Canada..... 1940
LANGFORD, DR. ARTHUR N., Bishop's University, Lennoxville, Quebec, Canada..... 1952
LANGSTROTH, JAMES H[EIDEL], Box 1130, Silver City, New Mexico..... 1924
LANNING, ROBERT GEORGE, 257 Coleman St., Belleville, Ontario, Canada 1942
LANYON, WESLEY E., Department of Zoology, University of Wisconsin, Madison, Wisconsin..... 1947
LAPHAM, VIRGIL TEXAS, Delta National Wildlife Refuge, Pilottown, Louisiana..... 1946
LAPORTE, DR. PAUL C., Box F20, Edmundston, New Brunswick, Canada 1952
LARKIN, HARRY HUBBARD, 189 Van Rensselaer St., Buffalo 10, New York 1949
LARRABEE, AUSTIN P[ARK], 534—99th Ave., N. E., Bellevue, Washington 1918
LARRISON, EARL JUNIOR, Department of Biological Science, University of Idaho, Moscow, Idaho..... 1946
LM LASKEY, AMELIA R. [MRS. F. C.], 1521 Graybar Lane, Nashville, Tennessee.....(1933) 1951
LATHAM, ROY, Orient, Long Island, New York..... 1916
LATHROP, EARL W., Box 81, College Heights, Alberta, Canada..... 1952
LATTA, KATHARINE, 430 W. Moreland Ave., Philadelphia 18, Pennsylvania 1949
LATTA, WILLIAM C[ARL], Institute for Fisheries Research, University Museum Annex, Ann Arbor, Michigan..... 1948
LATVEN, DR. K. CHARLES, 3224 N. Abingdon St., Arlington, Virginia.... 1946
LAUGHLIN, ROBERT M[OODY], Drake's Corner Rd., Princeton, New Jersey 1951
LAW, CECEL E[RNEST], D. R. N. L. MPO 1015, Fort Churchill, Manitoba, Canada..... 1953

LAWRENCE, A[LEXANDER] G[EORGE], 104 Sherburn, Winnipeg, Manitoba, Canada 1920
LAWRENCE, DR. JOHN M., 2203 Easy St., Rt. 1, Pullman, Washington.. 1952
LAWRENCE, MRS. LOUISE DE KIRILINE, Rutherglen, Ontario, Canada.... 1946
LAWSON, RALPH, 5 Carpenter St., Salem, Massachusetts 1917
LAYCOCK, JOHN TAYLOR, 392 Lakeshore Dr., Baton Rouge, Louisiana.... 1953
LAYCOCK, MRS. ROBERT C. [SUSAN B.], Crosswicks, New Jersey 1951
LEA, DR. ROBERT B[ASHFORD], 1640 Dufossat St., New Orleans 15, Louisiana 1941
LEACH, AGNES [MRS. HENRY G.], 1021 Park Ave., New York 28, New York 1949
L LEARING, GEO[RGE] RICHMOND, 168 Beacon St., Boston, Massachusetts... 1924
LEAVITT, BENJAMIN B., Department of Biology, University of Florida, Gainesville, Florida 1947
LEAYCRAFT, MRS. EDGAR C. [HELEN B.], Hills Point Rd., Westport, Connecticut 1950
LEE, GEORGE R[EYNOLDS], 514 Valencia Dr., N. E., Albuquerque, New Mexico 1949
LEEDY, DR. DANIEL L[ONEY], Fish and Wildlife Service, Department of Interior Bldg., Room 2254, Washington 25, D. C. 1937
LEES-SMITH, D[EREK] T[HAYER], Broadmoor Hospital, Crowthorne, Berkshire, England 1951
LEFEBVRE, EUGENE ALLEN, 2300 E. Co. Rd. E., White Bear 10, Minnesota 1953
LEFEVRE, RUFUS H[ARRY], 228 W. Broad St., Tamaqua, Pennsylvania... 1927
LEGG, MRS. DOROTHY C[OGAN], 1823 Irving Ave. S., Minneapolis 5, Minnesota 1950
LEHMAN, JOHN R[OBERT], 129 Wilson Dr., Pittsburgh 35, Pennsylvania.. 1949
LEISTER, CLAUDE W[ILLARD], Pocono Wild Animal Farm, R. R. 1, Stroudsburg, Pennsylvania 1916
LEMIEUX, LOUIS, Apt. 46, 144 Grande Allee, Quebec, P. Q., Canada..... 1949
LEMMON, ROBERT S[TELL], Olmstead Hill, Wilton, Connecticut 1950
LENGEMANN, MARTHA A., 360 Cedar St., Imlay City, Michigan..... 1949
LENHERT, P[AUL] GALEN, 103 E. George St., Arcanum, Ohio 1952
LENSINK, CALVIN J[AY], 4236 Abbott Ave. No., Minneapolis 22, Minnesota 1951
M LEOPOLD, DR. A[LDO] STARKER, Museum of Vertebrate Zoology, Berkeley 4, California ..... (1940) 1946
LESPERANCE, THOMAS A[NDREW], 75 N. Sable St., Keeseville, New York.. 1951
LESTER, JOSEPH E[VANS], R. R. 1, Aliquippa, Pennsylvania 1952
LEUPOLD, NORBERT H., 3555 S. E. Insley, Portland 2, Oregon 1946
LEVI, DR. HERBERT W., University of Wisconsin, Extension Center, Wasau, Wisconsin 1952
LEWIS, MRS. ALICE HAY, 212 N. Wilton Pl., Los Angeles 4, California.... 1952
LEWIS, C. BERNARD, Science Museum, Institute of Jamaica, Kingston, Jamaica, British West Indies 1947
LF LEWIS, DR. HARRISON F., West Middle Sable, Shelburne County, Nova Scotia, Canada ..... (1912) 1942
LEWIS, JOSEPH S., 86 S. Main St., Spring Grove, Pennsylvania..... 1953
LEWIS, WILLIAM O[WEN], Ivy, Virginia 1951
LIDICKER, WILLIAM [ZANDER], JR., 116–17 Union Turnpike, Forest Hills, Long Island, New York 1950

LIEBE, HAROLD J[OHN], 500 Prospect Ave., Hartford 5, Connecticut.... 1943
LIEFTINCK, JOHN E[DMUND], c/o Goodyear S. A., Luxembourg City, Luxembourg 1949
LIEN, BOYD M[ARTEN], 5148—29 Ave. S., Minneapolis 17, Minnesota.... 1951
LIGAS, FRANK J[OHN], R. No. 3, Box 133, Barberton, Ohio..... 1951
M LIGON, J[AMES] STOKLEY, Box 950, Carlsbad, New Mexico.....(1912) 1927
LILLY, MRS. A. W. [ELSIE P.], 6530 Kenwood Ave., Chicago 37, Illinois.. 1950
LINCOLN, EDWARD PALMER, Box 9594, University of Arizona, Tucson, Arizona 1953
LF LINCOLN, FREDERICK C., Fish and Wildlife Service, Department of the Interior, Washington 25, D. C..... (1910) 1934
LINDER, RAYMOND LEWIS, 214 E. Huskerville, Lincoln, Nebraska..... 1953
LINFORD, JAMES B., 538 Fairbanks Ave., Oakland 10, California..... 1952
F LINSDALE, DR. JEAN M., Jamesburg Route, Carmel Valley, California (1922) 1945
LINTEREUR, LEROY J., Box 57, R. F. D. No. 3, Burlington, Wisconsin.. 1952
LINTON, M[ORRIS] ALBERT, 315 E. Oak Ave., Moorestown, New Jersey.... 1928
LIPP, FRANK, 1519 Greenville Highway, Hendersonville, North Carolina.. 1948
LIVERMORE, JOHN WALTON, 135 E. 54th St., Apt. 11B, New York 22, New York 1947
LLOYD, CLARK K[ORNER], 11 N. Elm St., Oxford, Ohio..... 1949
LF LLOYD, HOYES, 582 Mariposa Ave., Ottawa, Ontario, Canada....(1916) 1932
LLOYD, MRS. WILMOT, 582 Mariposa Ave., Rockcliffe Park, Ottawa, Ontario, Canada 1925
LOCKWOOD, DR. ROBERT MINTURN, Veterans Administration Hospital, McKinney, Texas..... 1947
LOETSCHER, DR. FREDERICK WM., JR., 507 W. 3rd St., Danville, Kentucky 1938
LONG, MRS. ALBERT E. [ROBERTA J.], 45 Clarendon Ave., San Francisco 14, California 1952
LONG, BETTY HOLMES [MRS. HARRY], Green Brier Rd., Westport, Connecticut 1949
LONG, RALPH HAMILTON, JR., 1734 Kline Rd., Ithaca, New York..... 1952
LONGFIELD, MRS. CARL [TESSIE CHANDON], Sunrise H'way and Irish Lane, East Islip, Long Island, New York..... 1949
LONGLEY, HARRY [EDWARD], 7241 LaSalle Blvd., Verdun, Quebec, Canada 1953
LONGLEY, WILLIAM H[OWARD], P. O. Box 362, Kasson, Minnesota..... 1943
M LONGSTREET, ROBERT JAMES, Rt. 2, Box 65C, DeLand, Florida....(1923) 1949
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LORD, DR. FREDERIC P[OMEROY], 39 College St., Hanover, New Hampshire 1922
LORING, GEORGE G[ARDNER], Bridge St., Manchester, Massachusetts.... 1949
LORY, MRS WILLIAM [HAZEL BRADLEY], 330 North Austin, Oak Park, Illinois 1947
LOSE, GEORGE WILLIAM, 3806 Blackburn Rd., Avondale, Canton, Ohio.. 1953
LOUKASHKIN, A. S., 1210—23rd Ave., San Francisco, California..... 1941
LOVELL, DR. HARVEY B[ULFINCH], 3011 Meade Ave., Louisville 4, Kentucky 1943
LOVETT, MRS. ROBERT A., "Pleasance," Locust Valley, Long Island, New York 1953
LOVIN, CHARLES E., 455 W. Harper Ave., Lenoir, North Carolina..... 1952

LM LOW, SETH H[ASKELL], Rt. 2, Gaithersburg, Maryland.....(1930) 1949
LOWE, GEORGE EDWARD, 9001 S. Cicero Ave., Oak Lawn, Illinois..... 1953
F LOWERY, DR. GEORGE HINES, JR., Museum of Zoology, Louisiana State University, Baton Rouge, Louisiana.....(1934) 1949
L LOWNES, ALBERT E., P. O. Box 1531, Providence, Rhode Island.... 1924
LOWTHER, MALCOLM A., 22599 Kane Ave., Detroit 23, Michigan..... 1953
LUDWIG, CHARLES, Crawford County Institute, Saegerstown, Pennsylvania..... 1949
LUDWIG, CLAUDE C., 279 Durand St., East Lansing, Michigan..... 1947
LUDWIG, DR. F[REDERICK] E[DWIN], 2864 Military St., Port Huron, Michigan..... 1949
LUESHEN, MRS. JOHN, Wisner, Nebraska..... 1952
LUKENS, WILLIAM WEAVER, JR., Upper Gulph Rd., Radnor, Pennsylvania 1946
LUMSDEN, H. G., Tweed, Ontario, Canada..... 1951
LUNDEVALL, C[ARL] F[REDRIK], Östergötlands Dagblad, Norrköping, Sweden..... 1951
LUNK, WILLIAM A., 2849 Whitewood, Pittsfield Village, Ann Arbor, Michigan..... 1938
LUNN, WILLIAM HERBERT, Hillier, Ontario, Canada..... 1948
LUPIENT, MRS. MARY LOUISE, 212 S. E. Bedford St., Minneapolis, Minnesota..... 1946
LUTHY, FERD[INAND], JR., 306 N. Institute, Peoria, Illinois..... 1937
LYONS, EUGENE ALBERT, 400 East Chapel, Pocatello, Idaho..... 1953
MACCRACKEN, MRS. HELEN DOLMAN, Box 1204, Estes Park, Colorado.. 1931
MACK, H. G., c/o Gilson Manufacturing Company, Guelph, Ontario, Canada..... 1933
MACKAY, R[ONALD] H[UGH], Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada..... 1950
MACKENZIE, DR. LOCKE L., 829 Park Ave., New York 21, New York.... 1946
MACKIEWICZ, JOHN STANLEY, 50 Oak St., Waterbury 4, Connecticut.... 1952
MACKWORTH-PRAED, C[YRIL] W[INTHROP], Castletop, Burley, near Ringwood, Hants, England..... 1928
MACLAY, MARK W[ALTON], 20 Exchange Pl., New York, New York..... 1905
MACLEAN, DOROTHY W[ILLIAMS], 112 East Ave., Norwalk, Connecticut.. 1931
MACMILLAN, MRS. JEANETTE COURTE, 3330 Eastside Ave., Cincinnati 8, Ohio..... 1952
MACMULLAN, R[ALPH] A[USTIN], Houghton Lake Wildlife Experiment Station, The Heights, Michigan..... 1938
MACPHERSON, ANDREW H[ALL], 16 Rupert St., Ottawa, Ontario, Canada 1951
MADISON, SAMUEL R., 18 Oakwood Place, Delmar, New York..... 1952
MADTES, GEORGE R., 337 E. Ravenwood Ave., Youngstown 5, Ohio..... 1949
MAGANN, JOSEPH WILBUR, 3711 N. McKinley, Oklahoma City 6, Oklahoma..... 1953
MAGNER, J[OHN] MARSHALL, 516 Bacon Ave., Webster Groves 19, Missouri 1948
MAGNEY, GERTRUDE BLACKWELL, [MRS. G. R.], 5329 Washburn Ave., So., Minneapolis 10, Minnesota..... 1950
MAHER, WILLIAM JOSEPH, 1831 E. 15th St., Brooklyn 29, New York.... 1953
MAINSTER, RAYMOND WAITE, 3716 Croydon Rd., Baltimore 7, Maryland 1953
MAIR, WILLIAM WINSTON, Canadian Wildlife Service, Department of Resources and Development, Ottawa, Ontario, Canada..... 1953

MALL, ROLF E[MIL], 2306 S. Harcourt Ave., Los Angeles 16, California.. 1952
MALLETTE, ROBERT D., 914 Taber Ave., Yuba City, California..... 1947
MALOOLEY, VULA STARN, R. R. 6, Terre Haute, Indiana..... 1947
MANDELL, PAUL I[RVING], Burton Judson Hall, University of Chicago, 1005 E. 60th St., Chicago, Illinois..... 1952
MANGELS, FREDERICK P[AUL], Hawk Mountain Sanctuary, Kempton R–2, Pennsylvania..... 1953
MANNERS, EDWARD R[OBERT], 216 New Broadway, Brooklawn, New Jersey..... 1941
M MANNING, THOMAS H[ENRY], 37 Linden Terrace, Ottawa, Ontario, Canada (1937) 1949
MANNIX, MRS. LUCILLE, 11424 Cedar Rd., Apt. E 2, Cleveland, Ohio.... 1947
MANSFIELD, MRS. LLOYD [LOUISE MINER], 44 Wingate Ave., Buffalo 16, New York..... 1949
MARBLE, RICHARD M[ERRILL], Woodstock, Vermont..... 1907
MARCUE, DOROTHY [JEAN], R. R. 2, LeMars, Iowa..... 1952
MARGOLIN, A[BRAHAM] S[TANLEY], Phoenix College Biology Department, Phoenix, Arizona..... 1949
MARIONNEAUX, ALICE S[TUNTZ] [MRS. BELFORT V.], Central Romana Corp., La Romana, Dominican Republic..... 1941
MARK, CYRUS, 270 Birch St., Winnetka, Illinois..... 1952
MARK, JAMES, Moose Factory, Moosonee, Ontario, Canada..... 1953
MARKS, JACK L[ORAN], Rt. 5, Box 780, Portland 1, Oregon..... 1949
MARSH, MARY F., 286 Queen St. W., Guelph, Ontario, Canada..... 1952
MARSHALL, DAVID B., Box 415, Fallon, Nevada..... 1942
M MARSHALL, DR. JOE T., JR., Department of Zoology, University of Arizona, Tucson, Arizona.....(1941) 1948
MARSHALL, PERRY R[AYMOND] F[OSTER], P. O. Box 1199, Santa Barbara, California..... 1952
MARSHALL, RAYMOND O[SCAR], 256 Ridge St., Leetonia, Ohio..... 1944
MARSHALL, TERRELL, 372 Skyline Dr., Park Hill, North Little Rock, Arkansas..... 1944
M MARSHALL, DR. WILLIAM HAMPTON, 300 Coffey Hall, University of Minnesota, St. Paul 1, Minnesota.....(1935) 1950
MARTIN, FRANK R., Foxholm, North Dakota..... 1953
MARTIN, PATRICK WALDYVE, 90 Valleyview, Kamloops, British Columbia, Canada..... 1948
MARTIN, PAUL, Box 532, West Chester, Pennsylvania..... 1945
MARTOLA, H. R., 140 Wellington St., Ottawa, Ontario, Canada..... 1953
MARVEL, DR. CARL S[HIPP], 404 W. Pennsylvania Ave., Urbana, Illinois.. 1951
MARVIN, PHILIP H., 1310 N. 11th St., Manhattan, Kansas..... 1952
M MASLOWSKI, KARL H[ERBERT], 1034 Maycliff Pl., Cincinnati, Ohio.(1935) 1951
MASON, C[HARLES] N[ATHAN], 6432 31st St., N. W., Washington 15, D. C. 1948
M MASON, C[HARLES] RUSSELL, 1376 Walnut St., Newton Highlands, Massachusetts.....(1936) 1947
MASON, EDWIN A., Arcadia Wildlife Sanctuary, Easthampton, Massachusetts..... 1943
MASON, ESTHER E[LIZABETH], 2523 Montgomery St., Louisville 12, Kentucky..... 1952
MASON, ROBERT F[RENCH], JR., Rt. No. 1, Apopka, Florida..... 1929

MASTERS, MRS. G. K. [KATHERINE], 444 Russell Hill Rd., Toronto, Ontario, Canada 1953
MATHER, RICHARD H., 5583 Queen Mary Rd., Hampstead 29, Montreal, Quebec, Canada 1947
MATHEWS, DR. FRANK P[ELLETREAU], Rt. 6, Box 308, Olympia, Washington 1923
L MATHIEU, J. A., Rainy Lake, Ontario, Canada 1952
MATOUSEK, FRANT, Halenarska 11, Trnava, Czechoslovakia 1953
MATTHEWS, WILLIAM HENRY, JR., 2 Berkeley Ave., Apt. 2F, Yonkers 5, New York 1948
MATTOCKS, JAMES [RICHARDSON], Professional Bldg., High Point, North Carolina 1949
MAY, DAVID D[OUGLAS], 1004 W. Nevada, Urbana, Illinois 1952
MAY, FRANKLIN H[INSDELL], 7401 Baltimore Ave., Takoma Park 2, Maryland 1937
MAY, FRED H[AMILTON], 211 Beall St., Lenoir, North Carolina 1952
M MAY, DR. JOHN B[ICHARD], 325 S. Main St., Cohasset, Massachusetts (1916) 1930
MAYER, CHARLES C[USHING] B[AILEY], R. F. D. 1, Colrain, Massachusetts 1949
MAYFIELD, DR. GEORGE R[ADFORD], Calhoun Hall, Vanderbilt Campus, Nashville, Tennessee 1917
M MAYFIELD, HAROLD FORD, 2557 Portsmouth Ave., Toledo 13, Ohio. . (1940) 1950
MAYHEW, WILBUR WALDO, 1002 Lake St., Apt. 2, Venice, California 1947
MAYNARD, DR. HERBERT E[RNEST], 2 Elmwood Ave., Winchester, Massachusetts 1921
LF MAYR, DR. ERNST, Museum of Comparative Zoology, Harvard University, Cambridge 38, Massachusetts ..... (1929) 1937
L MAZZEO, ROSARIO, 114 The Fenway, Boston, Massachusetts 1943
FE MCATEE, WALDO LEE, 3 Davie Circle, Chapel Hill, North Carolina . (1903) 1913
M MCCABE, DR. ROBERT A., 424 University Farm Place, Madison 5, Wisconsin ..... (1946) 1951
MCCLEARY, RALPH, 33 Lake Promenade, Long Branch, Toronto 14, Ontario, Canada 1952
MCCLUNG, ROBERT M[ARSHALL], New York Zoological Park, New York 60, New York 1949
MCCLURE, H[OWE] ELLIOTT, 406 Med. Gen. Lab., APO 500, San Francisco, California 1942
MCCLURE, J[OHN] F[RANCIS], 7050 N. Oatman Ave., Portland 17, Oregon 1951
MCCONNELL, HARRY B[URNS], 142 E. Warren St., Cadiz, Ohio 1947
HL MCCOOK, PHILIP JAMES, 25 East End Ave., New York 22, New York 1895
MCCORMICK-GOODHART, L[EANDER], "Bellapais," 610 E. Boulevard Dr., Alexandria, Virginia 1927
MCCOY, MRS. STERLING L. [MARGUERITE W.], R. R. 1, Box 250, Elgin, Illinois 1952
MCCUE, EARL N[EWLON], P. O. Box 104, Morgantown, West Virginia 1949
MCDONALD, DR. GEORGE V., Apple Hill, Ontario, Canada 1952
MCDOUGALL, MISS JANET, Box 372, Georgetown, Ontario, Canada 1952
MCELROY, THOMAS P., JR., The Pequot-sepos Wildlife Sanctuary, Pequot-sepos Ave., Mystic, Connecticut 1947
MCENTEE, ELINOR G., [MRS. HOWARD G.), 490 Fairfield Ave., Ridgewood, New Jersey 1949

McEwen, E[an] H., Aklavik, Northwest Territories 1952
McFadyen, Ross, 1563 Washington, Denver 3, Colorado 1952
McGaw, Mrs. G. H[ampton] [Elizabeth T(aylor)], 18 Beech St., Woodsville, New Hampshire 1949
McGeen, Dr. Daniel S., 707 Community National Bank Bldg., Pontiac, Michigan 1945
McGowan, Terry A[llen], 896 Glen Arden Way N. E., Atlanta, Georgia. 1952
McGranahan, Marjorie M., Box 838, Folsom, California 1952
McIlvain, John F[olwell], 141 E. Maple Ave., Langhorne, Pennsylvania 1949
McIlwaine, William B[aird], Jr., "Sysonby," R. R. 4, Petersburg, Virginia 1933
McIlwraith, T[homas] F[orsyth], 30 Strathallan Blvd., Toronto 12, Ontario, Canada 1933
McKay, Reg[inald] R., P. O. Box 5312, Jacksonville 7, Florida 1949
McKeever, Mrs. Katharine R[yan], P. O. Box 62, Water Mill, New York 1951
McKinley, Daniel Lawson, Mountain Grove, Missouri 1952
McKittrick, Thomas Harrington, 18 Pine St., c/o The Chase National Bank, New York 15, New York 1928
McKnight, Edwin T[hor], 5038 Park Pl., Washington 16, D. C. 1947
McLaren, Ian Alexander, 4890 Mayfair Ave., Montreal 29, Quebec, Canada 1951
McLaughlin, Frank Winnifred, 923 White Horse Pike, Apt. "B", Oaklyn, New Jersey 1947
McLaughlin, Vincent P., Jr., R. R. 2, Center Rd., Poland, Ohio 1938
McLaurin, Mrs. Mary Shelburne, Box 392, Washington, North Carolina 1952
McLean, Donald D[udley], 2455 Cottle Ave., San Jose 25, California.. 1930
McLeod, John A[llen], Jr., 113 E. Hendrix St., Greensboro, North Carolina 1950
McMillan, Eben, Cholame, California 1947
McMillan, Ian I[rving], Box 63, Shandon, California 1947
McMillan, W[illiam] G[arrett], Box 1447, Lubbock, Texas 1949
McMillan, William R[enton], 12701—12th Ave., N. W., Seattle 77, Washington 1938
McNeese, Charles H., 2916 Reveve, Houston 6, Texas 1953
McQuarrie, Harold James, Gore Bay, Ontario, Canada 1952
McQuate, Miss Nelda Jean, 374 Riverside Dr., Tiffin, Ohio 1953
McRae, Charles, Route 2, Austell, Georgia 1953
Meacham, Frank B., North Carolina State Museum, Raleigh, North Carolina 1947
Meade, Dr. Gordon M[ontgomery], Trudeau Sanatorium, Trudeau, New York 1936
M Meanley, M. Brooke, 4710 Keswick Rd., Baltimore, Maryland..(1935) 1952
L Medcalf, Robert, Apt. 102, 1431 S. W. Park Ave., Portland, Oregon.... 1943
Mehner, John F[rederick], 1003 James St., Pittsburgh 34, Pennsylvania 1948
Mein, Wm. Wallace, III, 1308 Canada Road, Woodside, California.... 1952
Meitzen, Logan Herman, R. R. No. 2, Box 63, Anahuac, Texas 1953

MEITZEN, DR. TRAVIS C., Box 308, Refugio, Texas 1942
MELLINGER, ENOS OREN, Chincoteague Wildlife Refuge, Box 62, Chincoteague, Virginia 1940
MENABONI, ATHOS, 1111 Cook Rd., R. 10, Atlanta, Georgia 1947
MENABONI, MRS. SARA, 1111 Cook Rd., R. 10, Atlanta, Georgia 1947
M MENDALL, HOWARD L[EWIS], 28 Pendleton St., South Brewer, Maine (1934) 1946
MENEFEE, COLE, 2738 Hilltop Drive, Odessa, Texas 1953
MENEFEE, EMORY, 1904 Barcelona Ave., Fort Myers, Florida 1950
L MENG, HEINZ, 116 Miller St., Ithaca, New York ..... (1944) 1950
M MENGEL, ROBERT M., Museum of Natural History, University of Kansas, Lawrence, Kansas ..... (1938) 1951
MEREDITH, REX, 121 Monckton Ave., Quebec, Canada 1927
MERITT, JAMES K., 99 Battle Rd., Princeton, New Jersey 1942
MERKEL, ROBERT S[YDNEY], 407 Ridge St., Charlottesville, Virginia 1953
MERS, WM. H., 1659 Marlowe Ave., Cincinnati 24, Ohio 1951
MESSENGER, AUBREY STEVEN, Powhatan, Virginia 1953
METCALF, HOMER N[OBLE], Department of Horticulture, Montana State College, Bozeman, Montana 1946
MEWALDT, LEONARD RICHARD, Department of Natural Sciences, San Jose State College, San Jose, California 1947
L MEYER, MISS HELOISE, Lenox, Massachusetts 1913
MEYER, DR. HENRY, 307 Spaulding Ave., Ripon, Wisconsin 1944
MEYERRIECKS, ANDRES J[OSEPH], 28 W. 96th St., New York 25, New York 1948
MICHENER, JOSEPHINE R. [MRS. HAROLD], 418 N. Hudson Ave., Pasadena 4, California 1950
MICHENER, ROBERT B., 1116 Finkbine Park, Iowa City, Iowa 1951
MICKEY, ARTHUR B., 1516 Rainbow Ave., Laramie, Wyoming 1936
MIDDLETON, MRS. ARCHIE D., Brady, Nebraska 1952
MIDDLETON, R[AYMOND] J[ONES], 131 N. Whitehall Rd., Norristown, Pennsylvania 1920
MIDDLETON, W[ILLIAM] R[OBERT], 106 N. Lincoln Ave., Wenonah, New Jersey 1948
MIGDALSKI, EDWARD C., Box 2025, Yale Station, Yale University, New Haven, Connecticut 1946
MILES, M[ERRIAM] L[EE], Chamber of Commerce, Daytona Beach, Florida 1941
MILLAR, ISABEL[LA] I[ZATT], 677 Merton St., Toronto 12, Ontario, Canada 1950
LF MILLER, DR. ALDEN HOLMES, Museum of Vertebrate Zoology, Berkeley, California ..... (1929) 1939
MILLER, MRS. ALICE D., 1150 Brewer Rd., Leonard, Michigan 1949
MILLER, MRS. CLARENCE H[EATH], 1354 Herschel Ave., Cincinnati 8, Ohio 1939
MILLER, CLARK, Inwood, West Virginia 1951
L MILLER, DOUGLAS SCOTT, 122 Lawrence Ave., East, Toronto, Ontario, Canada 1938
MILLER, MISS H[ELEN] ELIZABETH, Stromsburg, Nebraska 1950
MILLER, DR. JOHN R., 712 N. Peach Ave., Fresno 1, California 1946
LF MILLER, DR. LOYE H[OLMES], Museum of Vertebrate Zoology, Berkeley 4, California ..... (1918) 1930
MILLER, LYLE DEVERN, 650 Almyra Ave., Youngstown, Ohio 1947

MILLER, RICHARD F[IELDS], 2627 N. 2nd St., Philadelphia 33, Pennsylvania 1952
M MILLER, DR. ROBERT C[UNNINGHAM], California Academy of Sciences, San Francisco, California ..... (1935) 1942
MILLER, WILLIAM R[OSEWARNE], Fish and Game Service, R. F. D. 1, Milton, Vermont 1949
MILLIKEN, PHOEBE, Armonk, New York 1953
MILLIKEN, SAMUEL GIBBS, Kerrville, Box 245, Texas 1953
MILLION, ALBERT, 2060 Rustic Rd., Dayton 5, Ohio 1948
MILLS, DUDLEY H[OLBROOK], Glen Head, Long Island, New York 1929
MILLS, DR. HARLOW B[URGESS], Natural History Survey, Urbana, Illinois 1949
MILLS, MRS. PETER J. [NANCY M.], R. R. 2, Chesterton, Indiana 1950
MILLS, W[ILLETT] J[AMES], 100 Spring Garden Road, Halifax, Nova Scotia, Canada 1953
MILNES, HERBERT, Box 48, P. A. No. 1, Woodstock, Ontario, Canada 1952
MINICH, EDWARD C[ONRAD], 1047 Fairview Ave., Youngstown 2, Ohio ... 1949
MINOR, DON, Minong, Wisconsin 1952
MINOR, WILLIAM FAULKNER, Bristol Laboratories, Inc., Syracuse 1, New York 1946
MISKIMEN, MILDRED, Department of Physiology, Miami University, Oxford, Ohio 1951
MITCHELL, G[EORGE] J[OSEPH], Fish and Game Commission, Administration Bldg., Edmonton, Alberta, Canada 1949
M MITCHELL, HAROLD D[IES], 378 Crescent Ave., Buffalo, New York .. (1930) 1949
MITCHELL, MRS. HELEN W[EBER], Wade Park Manor, Cleveland 6, Ohio 1948
L MITCHELL, MRS. OSBORNE S. [MARGARET H.], c/o COBAST, Caixa Postal 4965, Rio de Janeiro, Brazil 1928
HL MITCHELL, DR. WALTON L[UNGERICH], 398 Vassar Ave., Berkeley 8, California 1893
MITCHENER, ALFRED J., 73 Market St., Collingwood, Ontario, Canada 1952
MOFFATT, ARTHUR ROY, Norwich, Vermont 1953
MOHR, MRS. CAROL B[URDEN], 20 LaFayette St., White Plains, New York 1952
MOHR, CHARLES EDWARD, Audubon Center, Quaker Ridge, Greenwich, Connecticut 1942
MONCRIEFF, J[ESSE] EDWIN, 2745 E. 8th St., National City, California .. 1949
MONK, H[ARRY] C[RAWFORD], 406 Avoca St., Nashville 5, Tennessee 1921
M MONROE, BURT L[EAVELLE], Ridge Rd., Anchorage, Kentucky .... (1935) 1947
MONROE, ENS. BURT L., JR., USNR, U. S. S. Badoeng Strait, CVE-116, c/o F. P. O., San Francisco, California 1953
MONROE, DR. JAMES, Ray Brook, New York 1940
M MONSON, GALE [WENDELL], P. O. Box 1717, Parker, Arizona ..... (1937) 1950
MONTAGUE, MRS. ROBERT P., 49 Spring Street, Southbridge, Massachusetts 1953
MONTEITH, DAVID Y[ATES], III, 409 Maple St., Columbia 5, South Carolina 1953
MONTGOMERY, CARL E[DWIN], 547 N. 8th St., Allentown, Pennsylvania .. 1944
MONTGOMERY, GEORGE HUGH, 4689 Westmount Ave., Westmount, Quebec, Canada 1947
MONZ, PAULINE [MAGDALENE], 110 Linglestown Rd., Harrisburg, Pennsylvania 1951
MOODY, A[DELBERT] J[OHN], c/o Aetna Life Insurance Co., Hartford, Connecticut 1918

L MOODY, OLIVE B[EAUCHAMP], 510 River Rd., Beaver, Pennsylvania..... 1949
MOODY, R[OLLIN] W[AYNE], 612 Harrison St., Denver 6, Colorado 1949
MOON, JENNIE S[ENNETT], 105 W. Woodbine St., Chevy Chase 15, Maryland 1949
MOON, DR. NEIL S[ENNETT], 257 Pemberton Rd., Rochester 9, New York 1949
MOORE, JAMES R[ICHARDS], Saybrook, Connecticut..... 1937
MOORE, JOSEPH C[URTIS], Everglades Natural History Association, Box 275, Homestead, Florida..... 1952
MOORE, MRS. OTIS R. [BERTHA S.], Box 145, Lamington Rd., Bedminster, New Jersey..... 1951
MOORE, ROBERT B[YRON], 1332 Alfred St., Baton Rouge, Louisiana..... 1949
LF MOORE, ROBERT THOMAS, Borestone Mt., Monson, Maine.....(1898) 1946
MOORE, TILFORD, 2265 Carter Ave., St. Paul 8, Minnesota..... 1945
MOREJOHN, GONZALO VICTOR, Box 26, R. F. D. 1, Davis, California..... 1947
MORENO, DR. ABELARDO, Universidad de la Habana, Havana, Cuba.... 1942
MORGAN, ALLEN H., Cochituate Rd., Wayland, Massachusetts..... 1947
L MORGAN, JOHN SAGE, 38 Garrison Rd., Brookline, Massachusetts..... 1927
MORINE, ALFRED M[ONROE], Hennepin, Illinois..... 1949
MORIOKA, H[IROYUKI], No. 114, Nonakashinden, 483, Kodaira, Tokyo, Japan..... 1950
MORLAND, THOMAS F[RANCIS] T[HORNHILL], University Club, 150 Elgin St., Ottawa, Ontario, Canada..... 1952
MORONY, JOHN J., JR., Alamo, Texas..... 1952
MORRISON, ALVA, 2 Garden Terrace, Cambridge 38, Massachusetts..... 1946
MORRISON, KENNETH DOUGLAS, R. F. D. 1, Armonk, New York..... 1947
MORRISSEY, THOMAS J., 325 McClellan Blvd., Davenport, Iowa..... 1947
MORROW, MRS. JOHN, JR. [DESSIE P(OWERS)], 1320 N. State St., Chicago 10, Illinois..... 1947
MORSE, MISS MARGARETTE E[LTHEA], 122 W. South St., Viroqua, Wisconsin..... 1919
MORTENSEN, HEMMING, 217–12 102nd Ave., Queens Village, New York.. 1953
MOSER, DR. HOWARD F[RANKLIN], 315 Cresswell St., Ridley Park, Pennsylvania..... 1948
LM MOSER, DR. R[EUBEN] ALLYN, 911 S. 89th St., Omaha 6, Nebraska. (1940) 1947
MOSES, DR. LEON, 8 E. 75th St., New York 21, New York..... 1948
MOSKI, HENRY C[HARLES], JR., 20 St. James St., Hamden 14, Connecticut 1952
MOSTOLLER, RALPH V[ICKROY], 1 Cleveland St., Johnstown, Pennsylvania 1936
MOULTON, FRANCIS S[EVERN], 14 Acorn St., Boston 8, Massachusetts.... 1926
MOULTON, FRANCIS SEVERN, JR., 2 Elm St., Concord, Massachusetts.... 1947
MOUND, STANLEY W., R. R. 1, Vittoria, Ontario, Canada..... 1952
MOUNTFORT, GUY, Tower Barn, Farnham Common, Bucks, England.... 1953
MOUNTS, MRS. MARVIN U., 3009 Vincent Rd., West Palm Beach, Florida. 1953
MOYER, JACK T[HOMSON], 374th Fd Sv Sq., APO 704, c/o PM, San Francisco, California..... 1952
MUCHMORE, DR. WILLIAM B[REULEUX], 219 University Park, Rochester 20, New York..... 1949
L MUDGE, EDMUND W., JR., 5926 Averill Way, Dallas 5, Texas..... 1947
MUELLER, FRANK D[OUGLAS], 49 Radford Ave., Toronto, Ontario, Canada 1950
MUELLER, HELMUTH C[HARLES], 2756 N. Palmer St., Milwaukee 12, Wisconsin..... 1948

MUGGENBURG, BRUCE A., 1512 W. California, St. Paul 4, Minnesota..... 1952
MULLIGAN, WALTER F., 9210—49th Ave., College Park, Maryland..... 1947
MUNRO, DAVID AIRD, Department of Zoology, University of British Columbia, Vancouver, British Columbia, Canada..... 1947
M MUNRO, GEORGE C[AMPBELL], 3029 Hibiscus Drive, Honolulu 15, Hawaii (1939) 1945
F MUNRO, JAMES ALEXANDER, Okanagan Landing, British Columbia, Canada.....(1913) 1941
MUNTER, W[ILLIAM] H[ENRY], 550 Federal Bldg., Seattle, Washington... 1927
MURDOCK, JAMES [INGRAM], 311 Irving Place, Glendale, California..... 1943
MURDY, H[ORATIO] W[ILLIAMS], P. O. Box 418, Webster, South Dakota.. 1949
M MURIE, O[LAUS] J[OHAN], Moose, Wyoming.....(1913) 1934
MURPHY, GRACE E[MELINE] BARSTOW [MRS. ROBERT C.], "Briarlea," Old Field, Setauket, New York..... 1919
MURPHY, JOSEPH ROBISON, 913 H. St., Lincoln 8, Nebraska..... 1952
F MURPHY, DR. ROBERT CUSHMAN, American Museum of Natural History, Central Park West at 79th St., New York 24, New York....(1905) 1920
MURRAY, DOUGALD, R. R. No. 1, Melbourne, Ontario, Canada..... 1952
M MURRAY, J[OSEPH] J[AMES], 6 White St., Lexington, Virginia.....(1928) 1936
MUSGROVE, JACK W[ARREN], 2414 Adams St., Des Moines, Iowa..... 1946
MUSSELMAN, DR. T[HOMAS] E[DGAR], 124 S. 24th St., Quincy, Illinois..... 1922
MYERS, BUFORD M[ACMARTIN], JR., 45 Oakland St., New Orleans 23, Louisiana..... 1952
MYERS, EVERETT C., Bowling Green State University, Bowling Green, Ohio..... 1949
MYERS, MRS. HILL, Box 106, Mansfield, Louisiana..... 1953
MYKLEBUST, ROY J[OHN], Box 191, Benton, Missouri..... 1948
NAKAMURA, TSUKASA, Kichizawa-mura, Naka-Koma-gun, Yamanashi Pref., Japan..... 1953
NASH, NATHANIEL CUSHING, IV, 22 Summer St., Goffstown, New Hampshire..... 1940
NAUMBURG, WALTER W[EHLE], 121 E. 64th St., New York 21, New York.. 1923
LF NAUMBURG, MRS. WALTER WEHLE [ELSIE], 121 E. 64th St., New York 21, New York.....(1916) 1952
NEAL, MRS. CHARLES, Box 133, Demorest, Georgia..... 1947
NEESS, JOHN CARL, Department of Zoology, Birge Hall, University of Wisconsin, Madison, Wisconsin..... 1948
M NEFF, JOHNSON A[NDREW], Wildlife Research Laboratory, Bldg. 45, Denver Federal Center, Denver 2, Colorado.....(1919) 1951
NEHER, HARRY T[RAINOR], 817 Radcliffe St., Bristol, Pennsylvania..... 1951
NELSON, MRS. CHARLES E., JR., 124 Oxford Rd., Waukesha, Wisconsin.. 1938
NELSON, MRS. EDITH T., 650 Blair Ave., Piedmont 11, California..... 1952
NELSON, G[AYLE] H[ERBERT], Department of Biology, Washington Missionary College, Takoma Park, Washington 12, D. C..... 1950
NELSON, G[IDEON] E[DMUND], JR., Department of Biology, Alabama College, Montevallo, Alabama..... 1949
NELSON, GRACE SHARRITT [MRS. ALMER P.], National Elk Refuge, Jackson, Wyoming..... 1949
NELSON, HARRY P[ETER], 838 N. Cass St., Milwaukee 2, Wisconsin..... 1948
NELSON, HARVEY K., Fish and Wildlife Service, Branch of Wildlife Refuges, Washington 25, D. C..... 1953

L NELSON, DR. THEODORA, 315 E. 68th St., New York 21, New York..... 1927
NERO, ROBERT W[ILLIAM], University of Wisconsin Department of Zoology, Madison, Wisconsin..... 1950
NESS, ROBERT D[AVID], 17 Five Points Rd., Rush, New York..... 1951
NESSLE, JAMES P[HILIP], 1823 Barrows St., Toledo 12, Ohio..... 1949
NETHERTON, HAZEL I. M. [MRS. CLIFFORD L.], 1004 Wakefield Dr., Apt. No. B-1, Belle View Apts., Alexandria, Virginia..... 1947
NETTLETON, JOHN W., 1086 Avenue Rd., Toronto, Ontario, Canada..... 1952
NEU, DR. HAROLD N., 506 N. Elmwood Rd., Omaha 3, Nebraska..... 1952
NEW, JOHN G., Fernow Hall, Cornell University, Ithaca, New York..... 1946
NEWBERRY, A[NDREW] TODD, 70 Rock Spring Rd., West Orange, New Jersey..... 1952
NEWMAN, ARNOLD L., Route No. 1, Clare, Michigan..... 1953
M NEWMAN, ROBERT J[AMES], Zoology Department, Louisiana State University, Baton Rouge, Louisiana.....(1943) 1952
LF NICE, MRS. MARGARET MORSE, 5725 Harper Ave., Chicago 37, Illinois (1920) 1937
M NICHOLS, CHARLES K[ETCHAM], 212 Hamilton Rd., Ridgewood, New Jersey (1931) 1948
NICHOLS, MRS. CHARLES K., 212 Hamilton Rd., Ridgewood, New Jersey.. 1933
LM NICHOLS, JOHN TREADWELL, American Museum of Natural History, 79th St. & Central Park W., New York 24, New York.....(1901) 1914
NICHOLS, L[EON] NELSON, 331 E. 71, New York, New York..... 1917
NICHOLS, WILLIAM WALLACE, 515 Seaview Place, Vista, California..... 1950
NICHOLSON, DONALD JOHN, 1224 Palmer St., Orlando, Florida..... 1947
NICKELL, WALTER P[RINE], Cranbrook Institute of Science, Bloomfield Hills, Michigan..... 1941
M NIEDRACH, ROBERT J[AMES], Box 116A, R. R. 3, Littleton, Colorado. (1940) 1944
NIELDS, JAMES F., JR., Hardwick, Massachusetts..... 1952
NIELSEN, JOSEPH A[USTIN], 253 Warren St., Brooklyn 31, New York.... 1953
NIELSON, BEATRICE WISE, Rt. 1, Box 808—Nielsen Reservation, Red Bluff, California..... 1949
NIOSI, NICHOLAS, 65 Park Ave., Bloomfield, New Jersey..... 1953
NIPER, GAIL BROUGHTON [MRS. LEONARD C.], 99 Ridgewood Rd., Clifton, New Jersey..... 1949
NIVEN, KENNETH D[UNCAN], 61 Broadway, Monticello, New York..... 1949
NOLAN, JAMES R., 14 Edgewood Road, Peekskill, New York..... 1953
NOLAN, THOMAS B[RENNAN], U. S. Geological Survey, Washington, D. C. 1935
NOLAN, VAL, JR., 806 S. Henderson St., Bloomington, Indiana..... 1952
NORBY, DARWIN E[MIL], Department of Botany, Indiana University, Bloomington, Indiana..... 1950
NOREN, OSCAR B., 25415 Powers Rd., Farmington, Michigan..... 1947
NORMAN, EDWARD D'A[UBIGNY], Old Deerfield, Massachusetts..... 1951
NORRIS, ROBERT A[LLEN], Museum of Vertebrate Zoology, University of California, Berkeley 4, California..... 1939
NORRIS, RUSSELL T[APLIN], 56 Spofford St., Newburyport, Massachusetts 1938
NORTH, GEORGE W[EBSTER], 249 Charlton Ave., W., Hamilton, Ontario, Canada..... 1938
NORTHROP, DR. HARSON A., 358 E. Main St., Owatonna, Minnesota..... 1952
NORTHROP, MYRON, 7934 Delmar Blvd., University City 5, Missouri.... 1949

NORTHWOOD, JOHN D'ARCY, Mill Grove, Audubon, Pennsylvania..... 1946
NORTON, PETER, 115 Alpine Terrace, Oakland 18, California..... 1947
NOVAES, FERNANDO [DA] C[OSTA], Rua Toneleiros 186, Apt. 303, Copacabana, Rio de Janeiro, Brazil..... 1949
NOVY, DR. FRANK O., 420 S. Jefferson Ave., Saginaw 6, Michigan..... 1952
NUTT, DAVID C., Dogford Rd., Etna, New Hampshire..... 1938
NYC, FREDERICK F[RANCIS], Box 1294, San Angelo, Texas..... 1943
M OAKESON, DR. BARBARA BLANCHARD, University of California, Santa Barbara, California.....(1947) 1951
LF OBERHOLSER, DR. HARRY C[HURCH], 2933 Berkshire Rd., Cleveland Heights, Cleveland 18, Ohio.....(1888) 1902
OBERLY, DONALD B., R. R. 2, Urbana, Ohio..... 1947
OBRIEN, FLORA E., 118 S. W. 11th Ave., Miami, Florida..... 1953
O'BRIEN, PAUL J[OSEPH], 315 Grove St., Haddonfield, New Jersey..... 1953
OBUSEK, ANDREW W[ILLIAM], 317 Gumbert St., Portvue, McKeesport, Pennsylvania..... 1949
O'CONNELL, THOMAS B., 7 Pittsmore Rd., Roslindale 31, Massachusetts.. 1952
ODLUM, GORDON C[OLIN], Race Rocks, c/o Pilotage Authority, 300 Dallas Rd., Victoria, British Columbia, Canada..... 1948
ODOM, BABETTE MOORE [MRS. EDGAR R.], P. O. Box 458, Orange, Texas 1949
F ODUM, DR. EUGENE P[LEASANTS], University of Georgia, Athens, Georgia (1932) 1951
OEHSER, PAUL HENRY, Smithsonian Institution, Washington 25, D. C..... 1940
OGLOBLIN, DR. ALEJANDRO, Laboratorio Central de Acridiologia, Manuel De Pinazo, Pcia de Buenos Aires, Republica Argentina..... 1952
OLIVARES, ANTONIO, Colegio del Virrey Solis, Calle 73 No. 10-45, Bogotá, Colombia, South America..... 1952
OLIVER, JAMES H., JR., Box 145, Waynesboro, Georgia..... 1953
OLMSTEAD, ROSSITER D., 1323 Fern St., New Orleans 18, Louisiana..... 1952
OLMSTED, ROGER O., 818 Alabama, Lawrence, Kansas..... 1949
OLSEN, DR. RICHARD E[LLSWORTH], 3325 Franklin Rd., R. No. 3, Pontiac, Michigan..... 1949
OLSON, LEO B[ERNIE], 835 S. First St., Dekalb, Illinois..... 1949
OLSON, MRS. SIMON [GLADYS E(LIZABETH)], 33 Harvard Dr., Lake Worth, Florida..... 1951
OLSON, WILLIS A[RON], 311 W. Owatonna St., Duluth 3, Minnesota..... 1952
OMMANNEY, GEOFFREY G[REAM], Hudson Heights, Quebec, Canada..... 1941
O'NEIL, MRS. NORAH SELBY, 1311 Bonham St., Commerce, Texas..... 1948
ONO, MASAYUKI, 1835 Haneki-cho, Setagaya-ku, Tokyo, Japan..... 1951
ORBISON, DOUGLAS CAMPBELL, Guard Hill Rd., Mt. Kisco, New York.... 1947
O'REILLY, R[ALPH] A[NTHONY], JR., Davisburg, Michigan..... 1951
ORENSTEIN, JOSEPH J., 17–33 160th St., Whitestone 57, New York..... 1953
ORESMAN, STEPHEN B[ERGEL], 115 Central Park West, New York 23, New York..... 1948
ORME, NELLIE ELIZABETH, 522 N. 15th St., Clarinda, Iowa..... 1948
ORMONDROYD, JESSE, 2104 Copley Ave., Ann Arbor, Michigan..... 1949
ORR, MISS E[MMA] VIRGINIA, N. Valley Rd., Paoli, Pennsylvania..... 1939
ORR, HOWARD D[ENNIS], Department of Biological Sciences, University of Pittsburgh, Pittsburgh 13, Pennsylvania..... 1953
M ORR, DR. ROBERT T[HOMAS], California Academy of Sciences, Golden Gate Park, San Francisco 18, California.....(1937) 1941

ORTH, JOHN C., Trailside Museum, Bear Mountain, New York 1936
ORVIS, MRS. CLAY HARDIN, 164 E. 72nd St., New York 21, New York 1949
OVERING, ROBERT, R. F. D., No. 4, Raleigh, North Carolina 1929
OVERTON, MISS MARION F[RANCES], 42-11 Kissena Blvd., Flushing, New York 1950
OWRE, OSCAR T[HEODORE], 2625 Newton Ave. S., Minneapolis, Minnesota 1934
L PACK, ARTHUR NEWTON, Ghost Ranch, Abiquiu, New Mexico 1929
PACKARD, CHRISTOPHER M[OORE], Portland Museum of Natural History, Elm St., Portland, Maine 1950
PACKARD, FRED M[ALLERY], National Parks Association, 1840 Mintwood Place, N. W., Washington 9, D. C. 1935
PACKARD, ROBERT LEWIS, Kansas Museum of Natural History, Lawrence, Kansas 1953
PAFF, DR. WILLIAM A[LFRED], 2601 E. Jackson Blvd., Elkhart, Indiana .. 1927
PAINE, ROBERT T[REAT], III, 2 Hubbard Park, Cambridge, Massachusetts 1950
PALLAS, MISS DOROTHY CONSTANCE, 374 Sussex Rd., Wood-Ridge, New Jersey 1951
PALMER, GEORGE A[NTHONY], 24 Grampion Way, Dorchester, Massachusetts 1949
LM PALMER, DR. RALPH S[IMON], New York State Museum, State Education Bldg., Albany 1, New York ..... (1932) 1953
HL PALMER, SAMUEL COPELAND, Swarthmore College, Swarthmore, Pennsylvania 1899
LF PALMER, DR. THEODORE SHERMAN, 1939 Biltmore St., N. W., Washington, D. C. ..... (1888) 1901
PALMER, MRS. THEODORE SHERMAN [BERTHA ELLIS], 1939 Biltmore St., N. W., Washington, D. C. 1918
PALMER, WAYNE NEWMAN, TD3, 422-88-30, Barracks No. 372, Coddington Point, U. S. Naval Training Center, Newport, Rhode Island ... 1952
PALMQUIST, C[LARENCE] O[SCAR], 834 Windsor Rd., Glenview, Illinois 1950
PALUDAN, DR. KNUD, Vildtbiologisk Station, Rönde, Denmark 1953
PARK, CHARLES F[REDERICK], JR., Department of Geology, Stanford University, California 1936
PARKER, CLARENCE J., 821 N. Garfield Ave., Alhambra, California 1947
PARKER, HARRY C[LARENCE], c/o National Park Service, Fort Klamath, Oregon 1927
PARKER, HENRY M[ELVILLE], Wayland, Massachusetts 1940
PARKES, DR. KENNETH CARROLL, Section of Birds, Carnegie Museum, Pittsburgh 13, Pennsylvania 1947
PARKINSON, BARBARA JO, 415 Walnut St., Mt. Carmel, Illinois 1952
PARKS, RICHARD A., 2303 Pembrook Pl., N. E., Atlanta, Georgia 1947
PARMALEE, DR. PAUL W., Department of Zoology, Illinois State Museum, Springfield, Illinois 1953
PARMELEE, DAVID F[REELAND], 209½ W. Duffy St., Norman, Oklahoma . 1948
PARSONS, THOMAS STURGES, 15 Godwin Avenue, Ridgewood, New Jersey . 1953
L PARTRIDGE, WILLIAM H., Belgrano 363 Caseros F.C.S.M., Buenos Aires, Argentina 1953
PATTEN, BERNARD C[LARENCE], JR., Botany Department, Rutgers University, New Brunswick, New Jersey 1950
PATTEN, DR. JOHN A., Box 396, Department of Biology, Middle Tennessee State College, Murfreesboro, Tennessee 1948

PATTERSON, MISS CLARICE E., Dudley St., Hampden, Maine 1952
PATTERSON, DR. ROBERT L[ANSING], Wyoming Game & Fish Commission, Box 335, Cheyenne, Wyoming 1953
PAUL, LUCIUS H., 51 Riverview Place, Rochester 8, New York 1908
PAULSON, C. W. GEOFFREY, The Monotype Corporation, Ltd., Salfords, Redhill, Surrey, England 1947
PAULSON, DENNIS R[OY], 630 N. E. 22nd Territory, Miami 37, Florida 1952
M PAYNTER, DR. RAYMOND A[NDREW], JR., Museum of Comparative Zoology, Harvard University, Cambridge, 38, Massachusetts .....(1946) 1952
PEABODY, JAMES [BISHOP], American Consulate General, Hamburg–APO No. 69, c/o P. M., NYC, New York 1940
PEAKE, CYRIL BLACKETT, Apt. 302, 1445 Kingston Rd., Toronto 13, Ontario, Canada 1952
PEARSE, THEED, Comox, Vancouver Island, British Columbia, Canada .. 1926
PEARSON, ALLEN M[OBLEY], P. O. Box 1031, Auburn, Alabama 1940
PECK, ARTHUR FRANCIS, 1311 Needham Ave., New York 67, New York .. 1948
PEELLE, MILES L., 1039 College Ave., Adrian, Michigan 1948
PEFFER, MRS. THOMAS A., 49 West Depot St., Hellertown, Pennsylvania. 1953
L PELL, WALDEN, II, St. Andrew's School, Middletown, Delaware 1938
PELLEW, MISS MARION JAY, The Heights, Aiken, South Carolina 1919
PELOUBET, MRS. SIDNEY W., Moose Hill Road, Guilford, Connecticut 1939
M PEMBERTON, JOHN ROY, 714 W. Olympic Blvd., Los Angeles 15, California (1918) 1940
PENNINGTON, TULLY S[ANFORD], Box 664, Collegeboro, Georgia 1952
PEPALL, ROBERT L., 29 Wilberton Rd., Toronto 12, Ontario, Canada 1952
PEPPER, WILLIAM, 20 E. Bells Mill Rd., Philadelphia 18, Pennsylvania ... 1930
PEQUEGNAT, WILLIS E[UGENE], Department of Zoology, Pomona College, Claremont, California 1948
L PERKINS, DR. ANNE E[LIZABETH], 16 Dewall Rd., South Berwick, Maine .. 1917
PERRING, LOUISE F[RANKLIN], 4821 Cedar Ave., Philadelphia 43, Pennsylvania 1949
PERRY, ALFRED EUGENE, P. O. Box 658, College Place, Washington 1953
PERRY, FRANCES, Greene, Rhode Island 1949
PERRYGO, WATSON M[ONDELL], U. S. National Museum, Washington 25, D. C. 1949
PERSON, ELMER [G.], 406 Cleveland Ave., Ishpeming, Michigan 1949
PESSINO, CATHERINE M., 2627 St. Raymond Ave., New York 61, New York 1952
M PETERS, HAROLD S[EYMOUR], 968 Cumberland Rd., N. E., Atlanta 6, Georgia .....(1924) 1947
PETERSEN, ARNOLD J[EROME], Biology Department, Concordia College, Moorhead, Minnesota 1951
PETERSEN, PETER C., JR., 620 E. 30th St., Davenport, Iowa 1952
PETERSEN, WARREN M[ICHAEL], Box 285, Brigham City, Utah 1952
PETERSON, ALFRED, Box 201, Brandt, South Dakota 1920
PETERSON, ARTHUR S., 42 Overlook Rd., Cedar Grove, New Jersey 1952
PETERSON, LAWRENCE M[INOR], S. Ave. Extension, Bradford, Pennsylvania 1949
LF PETERSON, ROGER TORY, P. O. Box 7, Glen Echo, Maryland .....(1929) 1952
M PETRIDES, DR. GEORGE A[THAN], Department of Fisheries and Wildlife, Michigan State College, East Lansing, Michigan ..... (1941) 1949

LF PETTINGILL, DR. OLIN SEWALL, JR., 35 Sagamore Park, West Medford 55, Massachusetts.....(1930) 1947
PETTIT, LINCOLN C[OLES], Box 217, Hiram, Ohio..... 1949
PETTOCK, ANNE G[RACE], 233 S. 17th St., Allentown, Pennsylvania..... 1950
PEYTON, SIDNEY BURNS, R. R. 2, Box 260, Fillmore, California..... 1946
PHELPS, FRANK M[ILLS], 312 Fifth St., Elyria, Ohio..... 1912
PHELPS, JAMES H[ARVEY], JR., 717 S. Fourth Ave., Pocatello, Idaho..... 1933
L PHELPS, MRS. KATHLEEN DEERY, Apartado 2009, Caracas, Venezuela.... 1949
F PHELPS, WILLIAM H., Apartado 2009, Caracas, Venezuela.....(1937) 1952
LM PHELPS, WILLIAM H., JR., Apartado 2009, Caracas, Venezuela,..(1940) 1948
LM PHILLIPS, DR. ALLAN R[OBERT], 113 Olive Rd., Tucson, Arizona...(1932) 1946
PHILLIPS, HOMER WAYNE, Rt. 1, Box 81, Austin, Texas..... 1948
PHILLIPS, RICHARD E[DWARD], Oregon Cooperative Wildlife Research Unit, 210 Agric. Eng. Bldg., Corvallis, Oregon..... 1949
PHILLIPS, RICHARD S[TUART], 834 Liberty St., Findlay, Ohio..... 1946
PHILLIPS, WILLIAM B., 137 W. 81st St., New York 24, New York..... 1950
PICKENS, DR. A[NDREW] L[EE], 2701 Selwyn Ave., Charlotte, North Carolina..... 1949
PICKERING, ROBERT, 66 Menno St., Waterloo, Ontario, Canada..... 1948
M PIERCE, FRED JOHN, Winthrop, Iowa.....(1948) 1950
L PIERCE, ROBERT ALLEN, Department of Fish and Wildlife Resources, Kentucky Experimental Game Farm, Rt. 2, Frankfurt, Kentucky.. 1941
M PIRNIE, DR. MILES D., Conservation Bldg., Michigan State College, East Lansing, Michigan.....(1919) 1937
F PITELKA, DR. FRANK A[LOIS], Museum of Vertebrate Zoology, University of California, Berkeley 4, California.....(1937) 1948
PITTMAN, JAMES A[LLEN], 1138 Overbrook Dr., Orlando, Florida..... 1947
PLAISTEAD, WALTER, 95 Newcomb Rd., Tenafly, New Jersey..... 1952
PLAPP, DORIS A[NNE], 4140 N. Keeler Ave., Chicago 41, Illinois..... 1949
PLATFORD, SIDNEY D., 152 W. Duarte Rd., Arcadia, California..... 1937
M PLATH, KARL, 305 S. Cuyler Ave., Oak Park, Illinois.....(1925) 1950
PLATT, DWIGHT RICH, 1420 Ohio, Lawrence, Kansas..... 1953
PLATT, WILLIAM, Devon and Grubb Rds., Paoli, Pennsylvania..... 1949
HL POE, MISS MARGARETTA, Earl Ct., St. Paul & Preston Sts., Baltimore, Maryland..... 1899
POMEROY, F[RED] E[LMER], 342 College St., Lewiston, Maine..... 1920
POOLE, CECIL A[VERY], 1764 Topeka Ave., San Jose 26, California..... 1941
M POOLE, DR. EARL L[INCOLN], Public Museum, Reading, Pennsylvania (1916) 1942
LM POOR, HUSTACE HUBBARD, 7 Colonial Ct., New Canaan, Connecticut (1934) 1950
POPE, LILLIAN GORZYCKI, R. F. D. No. 1, Buzon No. 38, Rio Piedras, Puerto Rico..... 1948
PORTER, ELIOT F[URNESS], R. 1, Box 33, Santa Fe, New Mexico..... 1947
PORTER, RICHARD DEE, Ecological Research, University of Utah, Dugway Proving Ground, Tooele, Utah..... 1948
PORTER, T[HOMAS] WAYNE, Department of Zoology, Michigan State College, East Lansing, Michigan..... 1937
POSPICHAL, LEO B., Pte. Mouillee State Game Area, R. F. D. No. 2, Rockwood, Michigan..... 1952

POST, WILLIAM, JR., Hegeman's Lane, Glen Head, Long Island, New York 1951
POTTER, BEATRICE B[ROWN], 2111 Malvern Rd., Charlotte 7, North Carolina 1948
POTTER, DAVID M[ORRIS], 1557 Timothy Dwight College, Yale University, New Haven, Connecticut 1946
M POTTER, JULIAN K[ENT], 437 Park Ave., Collingswood, New Jersey..(1912) 1944
POTTER, L[OUIS] HENRY, R. R. No. 1, West Rutland, Vermont 1922
POTTER, N[ATHAN] S., III, Route 5, Huntington, New York 1952
L POTTS, F[RED] A[NDREW], 404 S. Main St., Waupaca, Wisconsin 1922
LM POUGH, RICHARD H[OOPER], American Museum of Natural History, Central Park West at 79th St., New York 24, New York .....(1922) 1947
POWELL, DAVID K[ENNETH], 5 Rockwood Pl., Apt. No. 6, Hamilton, Ontario, Canada 1953
POWLES, PERCIVAL M[OUNT], 253 Huron St., London, Ontario, Canada.. 1952
POYSER, MRS. FLORENCE E[DITH] [NORA], Box 1, Boulder City, Nevada.. 1952
PRATHER, MRS. ELIZABETH H[UNT], 400 Center Ave., Westwood, New Jersey 1951
PRATHER, MILLARD F[ILLMORE], P. O. Box 559, Fairfield, Alabama 1939
PRATT, HERBERT W[ATSON], 160 State St., Boston 9, Massachusetts 1948
PRATT, JOHN T[OWNSEND], 1969 Queen Ave., So., Minneapolis 5, Minnesota 1952
PRAY, RUSSELL H[ARVEY], 662 Santa Rosa Avenue, Berkeley 7, California 1949
F PREBLE, EDWARD A[LEXANDER], 3027 Newark St., N. W., Washington, D. C. .....(1892) 1935
PRENDERGAST, J[AMES] STAFFORD, Eden Hill, Tyrone, Pennsylvania 1949
PRESCOTT, DR. KENNETH WADE, United States Naval Preparatory School, U.S.N.T.C., Bainbridge, Maryland 1947
PRESTON, DR. F. W., Box 149, Butler, Pennsylvania 1952
PRESTWICH, ARTHUR A[LFRED], 61 Chase Road, Oakwood, London N. 14, England 1949
PRICE, CHARLES E[VANS], JR., Woodward Ave., Moylan, Pennsylvania... 1948
PRICE, WILLIAM B[RUCE], 172 N. Lancaster St., Athens, Ohio 1951
PRIMLEY, WALTER S., c/o American Chicle Co., 405 Lexington Ave., New York 17, New York 1934
PRINGLE, CORNELIA C[OVINGTON], 1816 Vallejo St., San Francisco 23, California 1950
PRIOR, E. GERTRUDE, Sweet Briar ,Virginia 1947
L PROCTER, MRS. LILLIAN S[ANFORD], Williamstown, Massachusetts 1928
PROCTOR, C. L., Armour Heights Public School, 148 Wilson Ave., Toronto, 12, Ontario, Canada 1952
PROCTOR, CHARLES A[LBERT], 23 Rope Ferry Rd., Hanover, New Hampshire 1947
PROSSER, ALBERT L[AURENCE], Box H., Springvale, Maine 1951
PROVOST, ERNEST E[DMUND], Zoology Department, Washington State College, Pullman, Washington 1952
PRUITT, MRS. WILLIAM O., JR. [ERNA NAUERT], Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1948
PRUSIECKI, EDWARD [JOSEPH], 231 N. California, Hobart, Indiana 1951
PUETT, MAY W[ILSON], P. O. Box 2183, Greenville, South Carolina 1952
PULICH, WARREN M[ARK], 2720 Frazier Ave., Fort Worth, Texas 1949
PURSELL, WILLIAM MCCLAIN, 511 Neilson St., Berkeley 7, California 1947

PUTMAN, WILLIAM L[LOYD], Dominion Entomological Laboratory, Vineland Station, Ontario, Canada 1937
PUTNAM, LOREN SMITH, Department of Zoology, Ohio State University, Columbus 10, Ohio 1942
PYLE, JEAN G., 1510 Fifth Ave., Oakland 6, California 1952
PYLE, ROBERT L[AWRENCE], P. O. Box 949, Wahiawa, Oahu, Hawaii 1953
QUATTLEBAUM, W[ILLIAM] D[AN], 1925 Paloma St., Pasadena 7, California 1924
QUAY, DR. W[ILBUR] B[ROOKS], Division of Mammals, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1946
QUAY, THOMAS L., Zoology Department, North Carolina State College, Raleigh, North Carolina 1942
QUEENY, EDGAR M[ONSANTO], Route 13, Kirkwood, Missouri 1950
QUINCY, MRS. LYMAN, 9 Frank Clarke St., Sumter, South Carolina 1950
RABOR, DIOSCORO S[IAROT], Silliman University, Dumaguete City, Negros Oriental, Philippines 1951
M RACEY, KENNETH, 6542 Lime St., Vancouver, British Columbia, Canada (1921) 1950
RAMEY, RALPH E[MERSON], JR., 2213 Century Drive, Columbus 11, Ohio. 1953
RAMISCH, MISS MARJORIE [VIOLA], 1835 Noble Rd., Apt. 28, East Cleveland 12, Ohio 1951
RAMSEY, A[LFRED] O[GDEN], McDonogh School, McDonogh, Maryland .. 1949
RAMSEY, JAMES W[ILSON], Route 5, Box 30, Greenville, Pennsylvania 1952
RAMSEY, RALPH L., 1578 N. Decatur Rd., Atlanta 6, Georgia 1947
F RAND, DR. AUSTIN LOOMIS, Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois ..... (1927) 1943
L RANDALL, CLARENCE BELDEN, 700 Blackthorn Rd., Winnetka, Illinois 1948
RANDALL, ROBERT N[EAL], 928 Sixteenth St., Bismarck, North Dakota .. 1939
RANDOLPH, EVAN, Corner of Seminole and Chestnut Aves., Philadelphia 18, Pennsylvania 1949
RANKIN, HENRY A[SHBY], JR., Box 803, Fayetteville, North Carolina 1952
LM RAPP, DR. WILLIAM FREDERICK, JR., 2759 F. St., Lincoln, Nebraska. (1939) 1950
RAUSCH, DR. ROBERT [LLOYD], United States Public Health Service, Box 960, Anchorage, Alaska 1949
RAWLINGS, WILLIAM HERBERT, Box 104, Valois, Quebec, Canada 1944
RAWSON, DR. GEORGE WILLIAM, Ciba Pharmaceutical Products, Inc., Summit, New Jersey 1952
L RAYMOND, OLNEY M[ARTIN], 129 Lincoln Pl., Brooklyn, New York 1930
RAYNOR, GILBERT S[IDNEY], Wading River Rd., Manorville, Long Island, New York 1937
READ, BAYARD W[HITNEY], Upper Dogwood Lane, Rye, New York 1949
READ, DUNCAN H., Middleburg, Virginia 1946
L REBMANN, G[ODFREY] RUHLAND, JR., 729 Millbrook Lane, Haverford, Pennsylvania 1948
REDJIVES, C[ASIMIR] F[RANCIS], 881 Washington Ave., Brooklyn 25, New York 1949
REECE, MAYNARD, 3405 50th St., Des Moines 10, Iowa 1948
REED, MRS. D. PAUL [JEAN D.], 16 E. 92nd St., New York 28, New York 1952
REED, EDWARD B., 157 Forest St., Fort Collins, Colorado 1953
REED, DR. ERIK K[ELLERMAN], National Park Service, Santa Fe, New Mexico 1953

REED, PARKER CROSBY, 27 Hayes Ave., Lexington 73, Massachusetts.... 1948
REESE, DR. CARL R[ICHARD], The Ohio State University, Department of Zoology and Entomology, Columbus 10, Ohio..... 1953
REESE, MRS. ROBERT M[ILLER] [REBECCA RAMSEY], 219 S. St. Asaph St., Alexandria, Virginia..... 1920
REESE, ROBERT W[ILLIAM], 3811 N. Washington Rd., Fort Wayne, Indiana 1949
REGAN, FRANCES M., 113–19 Colfax St., St. Albans 11, New York..... 1948
REGENNAS, CHARLES H[ENRY], JR., 130 W. Lemon St., Lititz, Pennsylvania..... 1950
REHFISCH, CAROL, 335 Delgado St., Santa Fe, New Mexico..... 1948
HL REHN, JAMES ABRAM G[ARFIELD], Academy of Natural Sciences, Logan Square, Philadelphia, Pennsylvania..... 1901
REICHERT, MRS. R[OBERT] J[ACOB] [ELSA], 14 W. First St., Mount Vernon, New York..... 1950
REID, MRS. BRUCE [BESSIE M.], Box 883, Silsbee, Texas..... 1918
REID, DONALD B[URNETT], 285 Maplewood Ave., Winnipeg, Manitoba, Canada..... 1952
REID, NEIL J., Mount Rushmore National Memorial, Keystone, South Dakota..... 1953
REILLY, EDGAR M[ILTON], JR., P. O. Box 34, Old Chatham, New York.... 1947
REITH, MARIE, 120–05 Long St., Jamaica 5, New York..... 1952
L RETT, EGMONT Z[ACHARY], Santa Barbara Museum of Natural History, Santa Barbara, California..... 1940
REUTHER, RONALD, 1336 Richmond St., El Cerrito, California..... 1947
REYNARD, GEORGE B[ERGIN], 728 Parry Ave., Palmyra, New Jersey..... 1950
REYNOLDS, DR. HAROLD C., Museum of Vertebrate Zoology, University of California, Berkeley 4, California..... 1947
REYNOLDS, MILDRED M. [MRS. PERRY J.], 5293 Bedford, Detroit 24, Michigan..... 1952
REYNOLDS, DR. T. ERIC, 140 Estates Drive, Piedmont 11, California.... 1941
REYNOLDS, MRS. T. ERIC [LAUREL], 140 Estates Dr., Piedmont 11, California..... 1953
REYNOLDS, THOMAS GEORGE, 92 Pine Ridge Rd., Pine Ridge, Media, Pennsylvania..... 1952
REYNOLDS, WILLIAM P[IUS], 1330 Foulkrod St., Philadelphia 24, Pennsylvania..... 1949
HL RHOADS, CHARLES J[AMES], Bryn Mawr, Pennsylvania..... 1895
RHODES, HARRY L., 503 Merriam Ct., Topeka, Kansas..... 1947
RICE, DALE W[ARREN], Biology Department, Box 39, University of Florida, Gainesville, Florida..... 1949
RICE, WARD J[ENNINGS], 5250 N. Pennsylvania St., Indianapolis 20, Indiana..... 1913
RICH, MRS. EVA, 150 W. 80th St., New York 24, New York..... 1946
RICHARDS, BOYD S[TEWART], Abney, Lot 64, Prince Edward Island, Canada 1950
RICHARDS, DR. JOHN W[ATSON], R. F. D. 2, Emmitsburg, Maryland..... 1953
RICHARDS, TUDOR, St. Paul's School, Concord, New Hampshire..... 1949
RICHARDSON, CARL, Trail, Oregon..... 1946
RICHARDSON, DAVID L[ORD], 1075 Park Ave., New York 28, New York.... 1949
L RICHARDSON, FLORA S. [MRS. W. D.], 4318 Oakenwald Ave., Chicago 15, Illinois..... 1925

RICHARDSON, DR. FRANK, University of Nevada, Reno, Nevada 1939
RICHMOND, DR. STANLEY MOORE, 156 E. 19th, Eugene, Oregon 1952
RICHTER, CARL H., 703 Main St., Oconto, Wisconsin 1939
RICHTER, DR. G[EORGE] WILLIAM, Guide Bldg., Canfield, Ohio 1951
RICKS, JOHN T[HOMAS], 507 Hunt Lane, Manhassett, Long Island, New York 1951
RIDGELY, [MR.] BEVERLY S[ELLMAN], 25 Everett Ave., Providence 6, Rhode Island 1949
RILEY, THOMAS J[AMES], Box 6, Brandywine Station, Schenectady, New York 1949
RIMSKY-KORSAKOFF, V[LADIMIR] N[ICHOLAS], Box 735, Center Moriches, Long Island, New York 1951
LF RIPLEY, DR. S[IDNEY] DILLON, II, Peabody Museum of Natural History, Yale University, New Haven 11, Connecticut ..... (1938) 1953
RISEBROUGH, ROBERT WILLIAM, Box 224, Richmond Hill, Ontario, Canada 1952
RISING, GERALD R[ICHARD], 72 Allen's Creek Rd., Rochester 18, New York 1952
RITCHEY, DARIUS T[EAGUE], 18—8th St., N. W., Minot, North Dakota .. 1949
RITCHIE, MRS. JACQUELINE M[AURICE], 1 Winthrop St., West Concord, Massachusetts 1951
RITCHIE, DR. ROBERT C[HARLES], 165 Alexandra Blvd., Toronto, Ontario, Canada 1944
RITCHING, WILLIAM R[USSELL], Gore Bay, Manitoulin Island, Ontario, Canada 1951
LM ROBBINS, CHANDLER SEYMOUR, Patuxent Research Refuge, Laurel, Maryland ..... (1944) 1949
ROBBINS, CHANDLER, JR., Sugar Island Camps, Greenville, Maine 1934
ROBBINS, MRS. ELEANOR C[OOLEY], [MRS. CHANDLER SEYMOUR], Patuxent Research Refuge, Laurel, Maryland 1939
ROBERT, HENRY C[OOKE], HDQ. and HDQ. Battery, First F. A. Battalion, Fort Ord, California 1949
ROBERTS, BERTRAND, 6951—33rd St., N. W., Washington 15, D. C. 1944
ROBERTS, MRS. FRANCES F., 1134 Glendon Ave., Los Angeles 24, California 1941
ROBERTS, HAROLD D[AVIS], 610 Harrison St., Black River Falls, Wisconsin 1949
ROBERTS, H[OWARD] RADCLYFFE, Box 493, Bryn Mawr, Pennsylvania 1924
ROBERTS, DR. J. HARVEY, Department of Zoology, Louisiana State University, Baton Rouge 3, Louisiana 1953
ROBERTS, NEDDIE O'MOORE, 3025 Pine Needle Rd., Augusta, Georgia ... 1948
HL ROBERTS, WILLIAM ELY, 29 W. Stratford Ave., Lansdowne, Pennsylvania 1902
ROBERTSON, HOWARD, 157 S. Wilton Dr., Los Angeles 4, California 1911
M ROBERTSON, JOHN MCB[RIAR], 1677 W. 9th St., Pomona, California . (1920) 1948
ROBINS, C[HARLES] RICHARD, 3300 N. Third St., Harrisburg, Pennsylvania 1948
ROBINSON, J[OHN] W[ILLIAM], 216 Redfern Ave., Apt. 6, Westmount, Montreal 6, Quebec, Canada 1951
ROBINSON, LUCILE W., Route 2, Box 82, Boring, Oregon 1951
ROBINSON, ROBERT W[ILLIAMS], P. O. Box 69, Ithaca, New York 1949
ROBINSON, THANE S[PARKS], Museum of Natural History, University of Kansas, Lawrence, Kansas 1952
ROCKEFELLER, WILLIAM A[VERY], Room 2610, 52 Wall St., New York 5, New York 1949

ROEHM, DR. HAROLD R., Lone Pine Rd., Bloomfield Hills, Michigan..... 1952
ROESLER, M[AX] STUART, June Rd., Cos Cob, Connecticut..... 1949
ROESLER, MRS. M[AX] STUART, [CAROL S.], June Rd., Cos Cob, Connecticut..... 1949
LM ROGERS, CHARLES H[ENRY], East Guyot Hall, Princeton, New Jersey 1904 (1921)
L ROGERS, GERALD [TALBOT], 217-A Laymon St., WP AFB, Ohio..... 1941
ROGERS, JOHN MATHER, 17 Phelps St., Binghamton, New York..... 1938
ROGERS, JOHN R., 3 Tremont St., Beverly, Massachusetts..... 1953
ROGERS, DR. KAY T[ROWBRIDGE], Department of Zoology, Oberlin College, Oberlin, Ohio..... 1949
ROGERS, [HENRY] THOMAS, 1306 Dakota Ave., Libby, Montana..... 1947
ROGERS, WALLACE, 715 Ellsworth Dr., N. W., Atlanta, Georgia..... 1921
ROGERS, MRS. WALTER E., 911 E. North St., Appleton, Wisconsin..... 1932
ROKOSKY, EMIL J[AMES], Racine Zoological Park, 2131 N. Main St., Racine, Wisconsin..... 1949
L ROLLIN, NOBLE, Primrose Cottage, Glanton, Northumberland, England.. 1946
ROLLO, MRS. W. E. [MARIE], Otis Rd., Barrington, Illinois..... 1940
ROONEY, JAMES, JR., 1514 S. 12th Ave., Yakima, Washington..... 1943
ROOT, OSCAR M[ITCHELL], Brooks School, North Andover, Massachusetts 1940
ROSE, LESTER G., 20 Garfield Lane, Napa, California..... 1952
ROSE, W[ILLIAM] C[UMMING], 710 W. Florida Ave., Urbana, Illinois..... 1950
ROSEGAY, MARY LOUISE [MRS. HAROLD], 216 Los Gallinas Ave., San Rafael, California..... 1942
ROSENTHAL, DR. MORTON LAWRENCE, 268 Linden Blvd., Brooklyn 26, New York..... 1953
ROSS, AARON B[ELNAP], 3562 Porter Ave., Ogden, Utah..... 1947
ROSS, C[HARLES] CHANDLER, 7924 Lincoln Dr., Chestnut Hill, Pennsylvania..... 1936
ROSS, MISS EDNA G[RACE], Almonte, Ontario, Canada..... 1948
ROSS, HOLLIS T[REVOR], 29 S. 2nd St., Lewisburg, Pennsylvania..... 1947
L ROSS, J[AMES] B[RENT], 2408 Westminster Way, N. E., Atlanta 6, Georgia 1949
ROSS, DR. LUCRETIUS H[ENRY], 507 Main St., Bennington, Vermont.... 1912
ROSS, REUBEN J., P. O. Box 190, Georgetown, Connecticut..... 1922
ROSS, ROLAND C., 1820 Bushnell Ave., South Pasadena, California..... 1925
F ROWAN, WILLIAM, Department of Zoology, University of Alberta, Edmonton, Alberta, Canada ..... (1920) 1950
ROWINSKI, LUDWIG J., 17 Schneider Pl., Passaic, New Jersey..... 1947
ROYALL, WILLIS C., JR., 236 E. 75th St., Apt. 4-A, New York 21, New York 1945
ROWLEY, J[OHN] STUART, 403 S. First St., Alhambra, California..... 1930
RUBENDALL, ELIZABETH, Winter Veterans Administration Hospital, Topeka, Kansas..... 1947
RUBEY, WILLIAM W., 5216 Westwood Dr., Washington 16, D. C..... 1933
RUDD, DR. CLAYTON GLASS, 315 Medical Arts Bldg., Minneapolis 2, Minnesota..... 1946
RUDD, DR. R[OBERT] L., Department of Zoology, University of California, Davis, California..... 1939
RUDOLPH, ROYSTON R[ICE], JR., Sabine National Wildlife Refuge, MRN Box 107, Sulphur, Louisiana..... 1949
RUNK, ALFRED E., Ramsey, New Jersey..... 1952

RUSSAK, MARSHALL L[OUIS], 1675 Metropolitan Ave., Bronx 62, New York 1951
RUSSELL, DR. L[ORIS] S[HANO], National Museum of Canada, Ottawa, Ontario, Canada ... 1951
RUSSELL, STEPHEN M[IMS], 267 E. Valley St., Abingdon, Virginia ... 1949
RUSSELL, DR. WHITFIELD LEGGETT, Box 22, Rhome, Texas ... 1941
RUSTAD, ORWIN A., Department of Biology, St. Olaf College, Northfield, Minnesota ... 1950
RUTTER, RUSSELL J[AMES], Box 445, Huntsville, Ontario, Canada ... 1928
RYCRAFT, THOMAS MATTEN, 427 E. 3rd St., Watsonville, California ... 1953
RYDER, RONALD A[RCH], U.S.S. Burton, Island (AGB-1), c/o FPO, San Francisco, California ... 1949
RYLANDER, [MICHAEL] KENT, Box 5303, North Texas Station, Denton, Texas ... 1953
RYSER, DR. FRED A., JR., Zoology Department, University of Wisconsin, Madison, Wisconsin ... 1951
SABIN, WALTON B., 1490 New Scotland Rd., Slingerlands, New York ... 1942
SABINE, MRS. WINIFRED S[PRAGUE], 503 Triphammer Rd., Ithaca, New York ... 1950
SAGE, EVAN V., R. R. 3, Waterloo, Iowa ... 1947
SALLEE, ROY M., Department of Biology, Western Illinois State Teachers College, Macomb, Illinois ... 1931
SALT, DR. GEORGE WILLIAM, Division of Zoology, University of California, Davis, California ... 1947
SAMPSON, DR. EDWARD, Guyot Hall, Princeton, New Jersey ... 1936
SAMPSON, W[ALTER] B[ERNARD], 1005 N. San Joaquin St., Stockton, California ... 1922
SANDERS, MISS ELLEN A[LLEN], R. R. 4, Campbellsville, Kentucky ... 1952
SANDERS, KATY FRIEL, Max Meadows, Virginia ... 1949
SANDFORD, WILLIAM F[OSTER], 87 Main St., Matawan, New Jersey ... 1951
SANDY, MISS TIRZAH M., University Hospital, Baltimore 1, Maryland ... 1953
SATHER, CARLYLE WILMAR, 1290 Grove St., Apt. 204, San Francisco 17, California ... 1953
SATTELY, DAVID CARL, 266 Center St., New Milford, New Jersey ... 1953
SATTER, JOHN M[ARCUS], 4500 Millersville Rd., Indianapolis 5, Indiana ... 1952
SATTERLY, JACK, Department of Mines, Parliament Bldgs., Toronto 2, Ontario, Canada ... 1947
SATTERTHWAIT, ELIZABETH ALLEN [MRS. ALFRED FELLENBERG], 775—19th Ave., S., St. Petersburg, Florida ... 1920
SAUER, DR. GORDON C[HENOWETH], 2620 Francis St., St. Joseph, Missouri 1948
SAUGSTAD, N. STANLEY, R. R. 4, Minot, North Dakota ... 1945
F SAUNDERS, ARETAS A[NDREWS], Box 141, Canaan, Connecticut ... (1907) 1950
M SAUNDERS, DR. GEORGE B[RADFORD], Fish and Wildlife Service, 624 Peachtree—Seventh Bldg., Atlanta 5, Georgia ... (1925) 1947
SAUNDERS, RICHARD M[ERRILL], 9 McMaster Ave., Toronto, Ontario, Canada ... 1935
SAUNDERS, SYDNEY B., 22 Wilberton Rd., Toronto, Ontario, Canada ... 1953
I,M SAVAGE, JAMES, 1014 Ellicott Square, Buffalo, New York ... (1895) 1934
SAVAGE, THOMAS, 203 E. 62nd St., New York 21, New York ... 1953
SAVERY, DON B[ROOKS], 8630 Chilson Rd., R. F. D. 1, Brighton, Michigan 1953
SAVILE, DR. D[OUGLAS] B[ARTON] O[SBORNE], 6 Oakland Ave., Ottawa, Ontario, Canada ... 1949

SAWYER, DOROTHY M[AY], 255 Whitney Ave., Apt. 41, New Haven, Connecticut 1936
SCATTERGOOD, LESLIE W[AYNE], Fish and Wildlife Service, West Boothbay Harbor, Maine 1949
SCHABER, LYLE, Box 256,Carbon, Alberta Province, Canada 1953
SCHAEFER, OSCAR FREDERICK, 825 Merchants Rd., Rochester, New York. 1916
SCHAEFFER, DAVID A[LAN], USN, U.S.S. LST. 602, c/o F.P.O., San Francisco, California 1952
SCHALLER, GEORGE BEALS, Box 272, University of Alaska, College, Alaska. 1953
SCHARFFENBERG, R[ICHARD] S[HIRLEY], 511 Boyd Ct., Washington 12, D. C. 1950
SCHAUGHENCY, C[HARLES B[ERTRAM], Village Rd., Green Village, New Jersey 1949
SCHEELE, WILLIAM E[ARL], The Cleveland Museum of Natural History, 2717 Euclid Ave., Cleveland 15, Ohio 1951
SCHEETZ, MRS. FRANCIS H[ARLEY], [VIRGINIA S.], 15 W. Old Gulph Rd., Gladwyne, Pennsylvania 1948
SCHEPKOWSKI, MISS RACHAEL ORR, Forest Hills, Brevard, North Carolina 1953
SCHETTY, FRANK R[OBERT], 237 LaSalle Ave., Hasbrouck Heights, New Jersey 1951
SCHLICK, FRANK, 117 Olmsted Pl., R. R. 3, Syracuse, New York 1947
SCHMIDT, KARL P[ATTERSON], Chicago Natural History Museum, Roosevelt Rd. and Field Dr., Chicago 5, Illinois 1950
SCHMIDT, THOMAS B., JR., 3700 Sharon St., Harrisburg, Pennsylvania 1947
SCHNEIDER, WALTER N[ORTON], 157 Van Tassel Ct., San Anselmo, California 1952
SCHNELL, JAY H[EIST], 1503 Bethlehem Pike, Flourtown, Pennsylvania ... 1952
SCHNITZER, ALBERT, 922 Lakeside Place, Elizabeth 3, New Jersey 1945
SCHOLES, ROBERT T[HORNTON], Bushnell, Illinois 1948
LF SCHORGER, DR. A[RLIE] W[ILLIAM], 168 N. Prospect Ave., Madison, Wisconsin ..... (1913) 1951
SCHOTTELIUS, BYRON ARTHUR, Box 686, Iowa City, Iowa 1951
SCHRAMM, WILSON C., 321 Kensington Rd., Syracuse 10, New York 1952
L SCHULTZ, ALBERT B[IGELOW], JR., 143 Patton Ave., Princeton, New Jersey 1948
SCHULZ, KENNETH RICHARD, 4008 Rhoda Ave., Oakland 2, California 1952
SCHUMM, WILLIAM G., 302 "C" St., LaPorte, Indiana 1944
SCHWALBE, PAUL W[AYMAN], Box 92, Gradyville, Pennsylvania 1952
SCHWARTZ, C[HARLES] W[ALSH], 131 Forest Hill, Jefferson City, Missouri. 1951
SCHWARTZ, PAUL A., Apartado 1766, Caracas, Venezuela 1952
SCHWARZ, HERBERT F[ERLANDO], American Museum of Natural History, Central Park West at 79th St., New York, New York 1925
SCHWEITZER, ROBERT DAVID, 1 Blackstone Pl., Riverdale 71, New York City, New York 1953
SCIPLE, GEORGE W[ASHINGTON], Wildlife Research Laboratory, Building 45, Denver Federal Center, Denver 2, Colorado 1949
SCOTLAND, DR. MINNIE B[RINK], 42 Continental Ave., Cohoes, New York. 1936
SCOTT, FITZHUGH, 7800 N. River Rd., Milwaukee 11, Wisconsin 1952
SCOTT, FREDERIC R[OBERT], 4600 Coventry Rd., Richmond 21, Virginia .. 1943
L SCOTT, DR. HORACE G[OLDEN], 5201 Woodlawn Blvd., Minneapolis 17, Minnesota 1951

Scott, Dr. John W[illiam], 1409 Garfield, Laramie, Wyoming..... 1934
Scott, Dr. Oliver K[ennard], 437 E. 13th St., Casper, Wyoming..... 1936
Scott, Dr. Thomas G[eorge], Game Research and Management, Illinois Natural History Survey, Urbana, Illinois..... 1938
Scott, Walter E[dwin], 1721 Hickory Dr., Madison 5, Wisconsin..... 1937
Scovell, D. E., 16 Beech Ave., Toronto 8, Ontario, Canada..... 1943
Scroggin, John B., Texas A. and M. College, Box 254, F. E., College Station, Texas..... 1953
Scudder, Thayer, Woodbury, Connecticut..... 1953
Sears, Joseph Alden, Hillside Rd., Northbrook, Illinois..... 1934
Secord, Dr. Alan C., 1105 Yonge St., Toronto, Ontario, Canada..... 1953
Seeber, Edward L., 213 Columbia St., Ithaca, New York..... 1943
Seely, Warner, 2171 Middlefield Rd., Cleveland Heights 6, Ohio..... 1948
Sefton, J[oseph] W[eller], Jr., c/o Sefton Investment Co., 638 F. St., San Diego, California..... 1922
Sehl, Robert H., 7027 Hegerman St., Philadelphia, Pennsylvania..... 1949
Seibert, Henri C[levet], Ohio University, Athens, Ohio..... 1934
Seibert, Robert F[redrick], 151 Garfield Pl., Maplewood, New Jersey 1949
Seiple, Stanley J., Grove City College, Grove City, Pennsylvania..... 1927
Selander, Robert K[eith], Museum of Vertebrate Zoology, University of California, Berkeley 4, California..... 1952
Selby, Gertrude Pettit [Mrs. James A.], Lookout Point, Ridgeville, Ontario, Canada..... 1947
Semprun, Dr. Rodolfo J[osé], Callao No. 1460, Buenos Aires, Argentina 1950
Sener, Ruth, 233 Charlotte St., Lancaster, Pennsylvania..... 1949
Serbousek, Lillian E., 1226 Second St., S. W., Cedar Rapids, Iowa.... 1947
Sette, Mrs. B[lanche] Carolyn, R. R. 2, Box 403-A, Nixon, New Jersey 1949
Sewall, Mrs. Sumner, 1132 Washington St., Bath, Maine..... 1952
L Shackleton, Walter H[odge], R. R. 1, Box 76a, Prospect, Kentucky... 1946
Shadle, Dr. Albert R[ay], Biology Department, University of Buffalo, Buffalo, New York..... 1928
Shaffer, Chester M[onroe], 279 Ave., D, S. E., Winter Haven, Florida. 1940
Shaftesbury, Dr. Archie D., Woman's College, University of North Carolina, Greensboro, North Carolina..... 1937
Sharp, Barton L[amar], 201 N. Broad St., Lititz, Pennsylvania..... 1931
Sharp, Dr. Ward M., Pennsylvania Cooperative Wildlife Research Unit, 206 Forestry Bldg., State College, Pennsylvania..... 1936
Shaub, Benjamin Martin, 159 Elm St., Northampton, Massachusetts.. 1947
Shaughnessy, Winslow M., 657 Forest Ave., Glen Ellyn, Illinois..... 1953
M Shaver, Dr. Jesse M[ilton], 1706 Linden Ave., Nashville 12, Tennessee (1924) 1932
Shaw, Dr. Charles H[icks], 109½ Mulberry St., Bremen, Ohio..... 1947
L Shaw, Henry S[outhworth], R. F. D. 1, Box 294-B, Westbrook, Maine.. 1916
Shaw, Mrs. Hugh E., 1103 7th St., South Nampa, Idaho..... 1952
Shearer, Dr. Amon R[obert], Mont Belvieu, Chambers Co., Texas.... 1905
Sheehan, Robert R[aymond], 815 Classen St., Norman, Oklahoma.... 1952
L Sheffler, William J[ames], 4731 Angeles Vista Blvd., Los Angeles, California..... 1928
Sheldamine, Charles G[arred], Box 647, Cobleskill, New York..... 1949
Shelton, Leonard A[gee], 313 First National Bldg., Pomona, California. 1947

SHENLEY, MRS. MARY A., c/o Pitometer Co., 50 Church St., New York 17, New York 1952
SHEPARD, FRANK P[ARSONS], JR., Meadow Lane, Greenwich, Connecticut. 1950
SHEPHERD, PRENTISS, JR., 431 Marlboro St., Boston, Massachusetts..... 1946
SHEPHERD, WILLIAM M[ARTIN], Box 414, Kenner, Louisiana..... 1952
SHEPPARD, R[OY] W[ATSON], 1805 Mouland Ave., Niagara Falls, Ontario, Canada 1928
SHERER, FRANK A., 546 Third St., Brooklyn, New York..... 1944
SHERWOOD, MRS. MARY P[ASCO], 113 Cook St., Ithaca, New York..... 1952
SHOEMAKER, CARL D., National Wildlife Federation, 3308—14th St., N. W., Washington 10, D. C..... 1938
SHORT, WAYNE, 1130 Fifth Ave., New York 28, New York..... 1943
M SHORTT, ANGUS HENRY, 101 Morier Ave., St. Vital, Manitoba, Canada (1946) 1951
M SHORTT, T[ERENCE] M[ICHAEL], Royal Ontario Museum of Zoology, Queen's Park at Bloor St., Toronto, Ontario, Canada.....(1931) 1943
SHREVE, BENJAMIN, 29 Chestnut St., Salem, Massachusetts..... 1933
M SIBLEY, DR. CHARLES G[ALD], Fernow Hall, Cornell University, Ithaca, New York.....(1939) 1949
SIBLEY, LONNIE M., East End Cottage, Rockefeller Refuge, Grand Chenier, Louisiana..... 1953
SICK, DR. HELMUT, Fundacao Brasil Central, Avenida Nilo Pecanha 23 III, Rio de Janeiro, Brazil..... 1947
SIMMONS, AMELIA [MRS. WILL(IAM) W.], 2742 N. Maryland, Milwaukee 11, Wisconsin..... 1946
L SIMMONS, EDWARD MCILHENNY, Avery Island, Louisiana..... 1941
LM SIMMONS, DR. GEORGE FINLAY, Hull Zoological Laboratory, University of Chicago, Chicago, Illinois.....(1910) 1923
L SIMMONS, GRANT G[ILBERT], JR., Lake Ave., Greenwich, Connecticut.... 1948
L SIMMONS, GRANT G[ILBERT], SR., Wiccafold, Greenwich, Connecticut.... 1949
SIMON, STEPHEN W[ISTAR], Monkton, Balto County, Maryland..... 1948
SIMPSON, DR. THOMAS W., 3252 Reynolda Rd., Winston-Salem, North Carolina..... 1952
SIMS, HAROLD LEE, Thibodaux, Louisiana..... 1937
SINCLAIR, LISTER S., 1 Windruch, Kleinburg, Ontario, Canada..... 1952
SINDT, MRS. JANE B., R. F. D. 1, Downers Grove, Illinois..... 1953
SINGLETON, ALBERT ROLAND, 3968 Marburg Ave., Cincinnati 9, Ohio... 1947
SISSON, MRS. CLYDE [KAY CURTIS], 1430 Wellington Dr., Columbia 4, South Carolina..... 1951
SIVERLING, MRS. SIGNA I., Bowbells, North Dakota..... 1952
SKAGGS, MERIT B[RYAN], Dodd Road—Route 3, Willoughby, Ohio..... 1951
SKELTON, KATHLEEN GREEN, 353 W. 57th St., New York 19, New York.. 1949
SKILLEN, DR. DONALD R[ALPH], 530 Georgian Rd., Pasadena 3, California 1929
LF SKUTCH, DR. ALEXANDER F[RANK], Finca "Los Cusingos," San Isidro del General, Costa Rica.....(1930) 1951
SLACK, MISS MABEL, 1004 Everett Ave., Louisville, Kentucky..... 1937
SLATER, MISS H. ELIZABETH, Board of Education of Anne Arundel Co., Box 951, Annapolis, Maryland..... 1953
L SLATER, H. N., Ridgeland, South Carolina..... 1949
SLIPP, JOHN WESLEY, 710 N. Ainsworth, Tacoma 6, Washington..... 1942

SLOCUM, MABLE L. [MRS. J. FRED], 29 Park St., Buffalo 1, New York... 1951
SMALL, ARNOLD, 614 San Emidio St., Taft, California..... 1953
SMALLEY, ALFRED EVANS, 608 N. Main St., Barbourville, Kentucky..... 1947
SMART, ROBERT W[ILLIAM], Dunbar Hall, Exeter, New Hampshire..... 1949
SMILEY, A[LFRED] K[EITH], JR., Mohonk Lake, New York..... 1928
SMILEY, DANIEL, JR., Mohonk Lake, New York..... 1928
SMITH, ALLEN G[ORDON], Fish and Wildlife Service, Box 603, Brigham City, Utah..... 1948
SMITH, EARL EMMETT, Harvard Forest, Petersham, Massachusetts..... 1947
SMITH, EARL R., Sta. B., Box 5271, New Orleans, Louisiana..... 1924
SMITH, E[LLA] ESTHER, Box 462, Murphysboro, Illinois..... 1949
SMITH, MRS. FRANK GLENROY [FRANCES B.], 231½ N. Main St., Jersey Shore, Pennsylvania..... 1949
SMITH, FRANK R[USH], Route 2, Box 93, Laurel, Maryland..... 1926
L SMITH, GEORGE A[RTHUR], 211 E. Avondale Rd., Greensboro, North Carolina..... 1942
SMITH, DR. HARRY M[ADISON], Department of Zoology and Physiology, University of Wyoming, Laramie, Wyoming..... 1938
SMITH, MRS. HERMAN DUNLAP [ELLEN THORNE], 121 Stone Gate Rd., Lake Forest, Illinois..... 1936
HL SMITH, HORACE G[ARDNER], 1327 Sheridan Blvd., Denver 14, Colorado... 1888
SMITH, IRENE M[ARIE], 1108—26th St., Des Moines 11, Iowa..... 1949
SMITH, MRS. J[ACK] MORGAN, 1434 N. Morningside Dr., N. E., Atlanta, Georgia..... 1952
SMITH, JEROME H., 4815 Erskine St., Omaha, Nebraska..... 1953
SMITH, MISS MARION L[UCILLE], 429 S. Willard St., Burlington, Vermont. 1950
SMITH, ORION O., 2911 Spring Creek Rd., Rockford, Illinois..... 1939
SMITH, MRS. OTIS H. [ANNA MARGARET], 107 Alexander Ave., Box 507, Larkspur, California..... 1947
SMITH, R[OBERT] DEMETT, JR., 4441 Quince Rd., Memphis 17, Tennessee 1951
SMITH, ROBERT L., R. R. No. 1, Reynoldsville, Pennsylvania..... 1944
SMITH, ROBERT LELAND, U. S. Geological Survey—G. and P., Washington 25, D. C..... 1952
LM SMITH, WENDELL PHILLIPS, Wells River, Vermont.....(1919) 1937
SMITH, WILLIAM WALTER, 673 Milverton Blvd., Toronto 6, Ontario, Canada..... 1947
SMITHE, FRANK B., 7 Center Dr., Douglaston, Long Island, New York.... 1949
SMITHE, F[RANK] NORTON, 647 E. 14th St., Apt. 4H, New York 9, New York..... 1947
SMITHERS, REAY H. N., National Museum of Southern Rhodesia, P. O. Box 240, Bulowayo, S. R., Africa..... 1953
SMOLA, FERDINAND G., 312 Patterson Bldg., Omaha 2, Nebraska..... 1952
SMOLKER, ROBERT E[LIOT], 1209 E. 58th St., Chicago 37, Illinois..... 1952
SMOOKER, GEORGE D[OUGLAS], c/o Royal Bank of Canada, West End Branch, Cockspur St., London, S. W. 7, England..... 1926
SMYTH, J[AMES] ADGER, Marine Biological Laboratory, Florida State University, Tallahassee, Florida..... 1933
SMYTH, DR. THOMAS, State Teachers College, Shippensburg, Pennsylvania 1921
SNAPP, MRS. R[OSCOE] R[AYMOND], 310 W. Michigan Ave., Urbana, Illinois 1947
SNYDER, DR. DANA PAUL, Section of Mammals, Carnegie Museum, Pittsburgh 13, Pennsylvania..... 1947

SNYDER, DOROTHY E[ASTMAN], The Peabody Museum, Salem, Massachusetts 1943

F SNYDER, L[ESTER] L[YNNE], Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, Canada ..... (1919) 1947

SOLMAN, DR. VICTOR E[DWARD] F[RICK], Canadian Wildlife Service, Department of Resources and Development, Ottawa, Ontario, Canada 1952

F SOPER, J[OSEPH] DEWEY, 10520—75th Ave., Edmonton, Alberta, Canada (1918) 1949

L SORRILL, ANNA MARIE [MRS. TOM], R. R. 2, Ursa, Illinois 1948

SPARKE, RICHARD W[ARRICK], 157 Archer St., Shreveport 64, Louisiana .. 1952

SPEAR, JOAN L[UCY], 39 W. Elm St., Yarmouth, Maine 1950

L SPEIRS, MRS. DORIS HUESTIS, "Cobble Hill," R. R. 2, Pickering, Ontario, Canada 1937

SPEIRS, DR. J[OHN] MURRAY, "Cobble Hill," R. R. No. 2, Pickering, Ontario, Canada 1935

SPENCER, HAVEN H., 3412 Oakwood, Ann Arbor, Michigan 1947

SPENCER, MISS O[LIVE] RUTH, 1030 125th Avenue Ct., Moline, Illinois ... 1941

SPERRY, CHARLES CARLISLE, 1455 S. Franklin St., Denver 10, Colorado .. 1920

SPIERS, DONALD R[ICHARD], 23 Elmore, Gloucester, England 1953

L SPINGARN, EDWARD D[ANIEL] W[OODBURY], 414 Jefferson St., Alexandria, Virginia 1924

SPOFFORD, DR. WALTER R[ICHARDSON], II, Department of Anatomy, State University of New York Medical Center, Syracuse, New York 1927

SPRICK, MARGARET M[ORTON] [MRS. G. B.], 215 Santa Fe Ave., Hamden 14, Connecticut 1949

SPRINGER, PAUL [FREDERICK], Patuxent Research Refuge, Laurel, Maryland 1941

F SPRUNT, ALEXANDER, JR., The Crescent, Charleston 50, South Carolina (1923) 1950

SPRUNT, ALEXANDER, IV, 693 Sutter St., San Francisco 2, California 1950

M SQUIRES, W[ILLIAM] AUSTIN, The New Brunswick Museum, Saint John, New Brunswick, Canada ..... (1946) 1950

STABLER, HAROLD B[ROOKE], 6123 Broad Branch Rd., Washington 15, D. C. 1937

STABLER, DR. ROBERT M[ILLER], Colorado College, Colorado Springs, Colorado 1940

STACKPOLE, RICHARD, Wayland, Massachusetts 1937

STAEBLER, DR. ARTHUR E[UGENE], W. K. Kellogg Bird Sanctuary, Hickory Corners, Michigan 1935

STAGER, KENNETH EARL, Los Angeles County Museum, Exposition Park, Los Angeles 7, California 1942

STAHL, MARJORETTA J[EAN], Kimberly, West Virginia 1949

STALLCUP, WILLIAM B[LACKBURN], JR., Biology Department, Southern Methodist University, Dallas, Texas 1951

STALOFF, CHARLES, 1776 Weeks Ave., Bronx 57, New York 1949

STAMM, ANNE L. [MRS. FREDERICK W.], 2118 Lakeside, Louisville 5, Kentucky 1946

STANLEY, DR. WILLARD F[RANCIS], State Teachers College, Fredonia, New York 1947

STANSFELD, ALAN W[ORTHLEY], 414 N. Cedar, Allegan, Michigan 1953

STANWELL-FLETCHER, MRS. JOHN F., [THEODORA C.], Dimock P. O., Pennsylvania 1933
STANWOOD, MISS CORDELIA J[OHNSON], Birdsacre, High St., Ellsworth, Maine 1909
STARK, EARL [VINCENT], 59 Chilton Rd., Toronto, Ontario, Canada 1948
STARR, DR. ROBERT R[USSELL], Howard Clinic, Glasgow, Kentucky 1949
STARRETT, ANDREW, Division of Mammals, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1949
STATON, JACK, "Calidris," Doveridge Ave., Carlton, nr., Nottingham, England 1948
STAUFFER, R[ALPH] S[TANLEY], 208 W. Irvin Ave., Hagerstown, Maryland 1949
STEARNS, DR. EDWIN I[RA], 928 Grant Ave., North Plainfield, New Jersey 1945
STEEL, WILLIAM C., 551 Morningside Dr., Miami Springs, Florida 1952
STEFFEN, PHILIP N., 2135 Balmoral Ave., Chicago 25, Illinois 1949
STEGEMAN, LEROY CALKINS, New York State College of Forestry, Syracuse 10, New York 1953
STEILBERG, ROBERT HAYS, 555 Sunset Rd., Louisville, 6, Kentucky 1952
STEIN, ROBERT C[ARRINGTON], 65 Wilton St., New Hyde Park, New York 1950
STEIRLY, CHARLES C[ORNELL], Virginia Forest Service, Waverly, Virginia 1947
STEPHENS, JAMES L[INLEY], JR., P. O. Box 841, Lumberton, North Carolina 1947
STERN, HERBERT, JR., 2400 General Taylor St., New Orleans 15, Louisiana 1949
STERNER, DR. LEWIS G[EORGE], Byberry Rd., Somerton, Philadelphia 16, Pennsylvania 1949
STETTENHEIM, PETER, Reading, Vermont 1951
STEVENS, C[ECIL] J[OHN], 2 Gordon Terrace, Lamb Park, Par, Cornwall, England 1948
STEVENS, CHARLES E[LMO], JR., 426 Second St., N. E., Charlottesville, Virginia 1946
L STEVENS, JOHN P., JR., Stevens Bldg., Broadway at 41st St., New York 36, New York 1939
STEVENS, O[RIN] A[LVA], State College Station, Fargo, North Dakota 1943
STEVENSON, DR. HENRY M[ILLER], Department of Zoology, Florida State University, Tallahassee, Florida 1940
M STEVENSON, JAMES O[SBORNE], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. ..... (1926) 1948
STEWARD, ORVILLE M[ILTON], P. O. Box 19, Fordham Branch, Bronx 58, New York 1950
STEWART, MISS MILDRED, 2219 Devonshire Dr., Cleveland 6, Ohio 1946
L STEWART, PAUL A[LVA], Department of Zoology and Entomology, Ohio State University, Columbus 10, Ohio 1928
M STEWART, ROBERT EARL, Patuxent Research Refuge, Laurel, Maryland (1938) 1949
STEWART, RONALD M., Massett, Queen Charlotte Islands, British Columbia, Canada 1947
STICKNEY, ELEANOR HERRICK [MRS. ALBERT, JR.], R. F. D., Rockfall, Connecticut 1933
STILES, BRUCE F[LEMING], 601—10th St., West Des Moines, Iowa 1939
STILLWELL, JERRY E., R. R. 2, Fayetteville, Arkansas 1934
STIMSON, LOUIS A[LBERT], 1835 Opeechee Dr., Miami 45, Florida 1943
STINE, MISS PERNA M., Box 386, Olney, Illinois 1936

STIRRETT, GEO[RGE] M[ILTON], Canadian Wildlife Service, Old Arts Bldg., Queen's University, Kingston, Ontario, Canada 1948
STITT, MERLE E., Grand Teton National Park, Moose, Wyoming 1952
STIVERS, ELIZABETH JEANNE, 3720 Macomb St., N. W. (Apt. 202), Washington 16, D. C. 1947
STODDARD, E[NOCH] V[INE], Gallup Lane, Waterford, Connecticut 1942
LF STODDARD, HERBERT LEE, Sherwood Plantation, Thomasville, Georgia (1912) 1936
STOKELY, JOHN M., 45 Marinita Ave., San Rafael, California 1952
STOKES, ALLEN W., Department of Wildlife Management, U.S.A.C., Logan, Utah 1947
STOLTENBERG, OTTO L., Florence Station, R. R. 2., Omaha 12, Nebraska .. 1949
STONE, RUDOLPH H[EGER], 505 Bedford Rd., Schenectady 8, New York .. 1949
STONER, MRS. C. BIRCH, 357 Hobart Ave., Short Hills, New Jersey 1944
L STONER, MRS. DAYTON, 399 State St., Albany, New York 1946
STONER, EMERSON A[USTIN], 285 E. "L" St., Benicia, California 1922
STOPHLET, JOHN J[ERMAIN], 2612 Maplewood Ave., Toledo, Ohio 1937
STORER, JOHN H[UMPHREYS], 579 Beaver St., Waltham, Massachusetts .. 1937
LF STORER, DR. ROBERT W[INTHROP], Museum of Zoology, University of Michigan, Ann Arbor, Michigan ..... (1935) 1952
M STORER, DR. TRACY IRWIN, Division of Zoology, University of California, Davis, California ..... (1916) 1922
STORRIE, MISS ROBINA, 443 S. Corona St., Denver, Colorado 1941
STOTT, KENHELM W[ELBURN], JR., Zoological Society of San Diego, Box 551, San Diego 12, California 1944
STOUT, GARDNER D., 14 Wall St., New York 5, New York 1952
STOUT, R. GWYNNE, Edge Hill, Glenn Rd., Ardmore, Pennsylvania 1940
STRAHAN, MRS. ANNA, P. O. Box 293, Fort Klamath, Oregon 1953
STRAW, RICHARD M[YRON], Rancho Santa Ana Botanic Garden, 1500 N. College Avenue, Claremont, California 1946
STRAWBRIDGE, WILLIAM J[USTICE], Paoli, Pennsylvania 1951
M STREET, PHILLIPS B[ORDEN], Exton, Pennsylvania ..... (1946) 1952
L STREHLOW, ELMER W., 520 E. Montana St., Milwaukee 7, Wisconsin 1945
STRINGHAM, EMERSON, Box 986, Kerrville, Texas 1941
STRONG, ALDEN M., c/o H. H. Roberts, Westport, Ontario, Canada 1952
F STRONG, DR. REUBEN M[YRON], 5716 Stoney Island Ave., Chicago 37, Illinois ..... (1889) 1949
STRUTHERS, DANA R[OBERTSON], 4858 Fremont Ave., South, Minneapolis 9, Minnesota 1949
M STUPKA, ARTHUR, Great Smoky Mountains National Park, Gatlinburg, Tennessee ..... (1934) 1948
STURDEVANT, CARLETON A[USTIN], R. D. 1, Prattsburg, New York 1949
L STURGEON, MYRON T[HOMAS], Department of Geography and Geology, Ohio University, Athens, Ohio 1938
STURGES, FRANKLIN W., 1587 Brook Lane, Corvallis, Oregon 1951
L SUGDEN, MARTIN [JAMES JAFFREY], 16 Alexandra Blvd., Toronto 12, Ontario, Canada 1952
SULLIVAN, ARTHUR, 197 Kingsway Ave., Winnipeg, Canada 1949
SUMMERS, DR. LAWRENCE, c/o University of North Dakota, Grand Forks, North Dakota 1953

M SUMNER, [EUSTACE] LOWELL, c/o National Park Service, 180 New Montgomery, San Francisco 5, California.....(1926) 1938
SUMNER, RUTH A[LLERTON], 420 N. 48th St., Omaha 3, Nebraska..... 1949
SUPER, RAYMOND R., 164 Maple Ave., Philadelphia 27, Pennsylvania.... 1953
SUTHARD, JAMES G[REGORY], 1881 Raymond Ave., Long Beach, California 1923
LF SUTTON, DR. GEORGE MIKSCH, University of Oklahoma, Norman, Oklahoma.....(1910) 1936
SWANK, WENDELL G[EORGE], 805 W. State Ave., Phoenix, Arizona..... 1951
SWANSON, CARL V[ERNON], Starbuck, Washington..... 1952
M SWANSON, DR. GUSTAV A., Fernow Hall, Cornell University, Ithaca, New York.....(1928) 1947
SWEATMAN, G[ORDON] K[ENNETH], 40 Alpine Ave., Hamilton, Ontario, Canada..... 1950
SWEDENBORG, E[RNIE] D[AVID], 4905 Vincent Ave., S., Minneapolis, Minnesota..... 1927
SWEENY, S[AMUEL] C[HADWICK], 26 Taylor St., Staunton, Virginia..... 1953
SWEET, DR. HERMAN R., Department of Biology, Tufts College, Medford, Massachusetts..... 1942
SWEET, W[ILLIAM] O[TIS], 175 Park St., Attleboro, Massachusetts..... 1943
SWENK, JANE B. [MRS. M(YRON) H(ARMON)], 2435 "A" St., Lincoln 2, Nebraska..... 1945
SWIFT, ISABEL H[OWLAND], 3 Hackett Circle W., Stamford, Connecticut.. 1949
SWIGART, EDMUND K[EARSLEY], 608 Harbor Rd., Southport, Connecticut 1951
SWINEBROAD, JEFF, P. O. Box 3008, University Station, The Ohio State University, Columbus, Ohio..... 1951
SYMMES, THOMAS C[ECIL] L[EYBURN], Box 844, Lusaka, Northern Rhodesia 1952
M TABER, WENDELL, 3 Mercer Circle, Cambridge, Massachusetts....(1933) 1948
TABOR, MISS AVA R[OGERS], 305 Canal Ave., Thibodaux, Louisiana..... 1937
TAFT, ELIZABETH A., 504 N. Blakely St., Dunmore Station, Scranton, Pennsylvania..... 1940
TAINTER, GRACE, 161 Emerson Pl., Brooklyn 5, New York..... 1952
TAINTOR, ELIZABETH T[ABER], 11 Story St., Cambridge 38, Massachusetts 1949
TALLMAN, WILLIAM S[WEET], JR., 4 Linden Pl., Sewickley, Pennsylvania.. 1942
TALMADGE, ROBERT R., Box 71, Willow Creek, California..... 1947
TANCOCK, [MONTAGUE] MONTY A., 425 Crocker Rd., Sacramento 19, California..... 1950
TANGER, LOUISE F[ORNEY] A[RNOLD], 318 N. President Ave., Lancaster, Pennsylvania..... 1949
TANGHE, LEO J[OSEPH], 852 Stone Rd., Rochester 16, New York..... 1949
TANGUAY, ABBE RENE, Ste. Ann's College, Ste. Ann de la Pocatiere, Kamouraska Co., Quebec, Canada..... 1944
M TANNER, DR. JAMES T[AYLOR], Department of Zoology, University of Tennessee, Knoxville, Tennessee.....(1933) 1947
TASHIAN, RICHARD E[ARL], Biology Department, Long Island University, Brooklyn 1, New York..... 1949
TASKER, RONALD REGINALD, 253 Old Orchard Grove, Toronto, 12, Ontario, Canada..... 1952
TAYLOR, HERBERT S[TANTON], 1369 Fair Ave., Columbus 5, Ohio..... 1948
TAYLOR, LAURETTA REID [MRS. G. L.], 622 W. 26 St., Kearney, Nebraska 1952
TAYLOR, DR. LEWIS WALTER, Department of Poultry Husbandry, University of California, Berkeley, California..... 1925

TAYLOR, DR. R[OBERT] L[INCOLN], 810 Highland Dr., Flintridge, Pasadena 3, California 1947

M TAYLOR, DR. WALTER PENN, 424 W. Harrison Ave., Claremont, California (1916) 1950

TAYLOR, WILLIAM E., 121 E. Remington Rd., Ithaca, New York 1952

TEACHENOR, DIX, 1020 W. 61st St., Kansas City 2, Missouri 1919

TEALE, EDWIN WAY, 93 Park Ave., Baldwin, Long Island, New York 1947

TEASDALE, ALICE F. [MRS. E. R.], 7436 S. Colfax Ave., Chicago 49, Illinois 1950

TEMPLEMAN, DR. WILFRED, Newfoundland Fisheries Research Station, St. John's, Newfoundland 1941

TENER, JOHN S[IMPSON], Canadian Wildlife Service, National Parks Branch, Department of Resources and Developments, Ottawa, Ontario, Canada 1949

TENNIS, HALL, Rt. 2, Box 98, Maitland, Florida 1953

TERRES, J[OHN] KENNETH, 345 E. 57th St., New York 22, New York 1934

TERRILL, MRS. ELIZABETH E[DITH], Ulverton, Quebec, Canada 1951

M TERRILL, LEWIS MCIVER, Ulverton, Quebec, Canada ..... (1907) 1947

M TERRY, MRS. R. A. [MARY ELLA MCCLELLAN DAVIDSON], 1521 Escobita Ave., Palo Alto, California ..... (1920) 1932

TERRY, DR. ROBERT J[AMES], University Club, St. Louis, Missouri 1919

THACHER, LOUIS B[ARTLETT], JR., 565 Gay St., Westwood, Massachusetts 1931

THAELER, CHARLES S[CHROPP], JR., Earlham College, Richmond, Indiana. 1953

THATCHER, DONALD M[ASON], 2916 Perry St., Denver 12, Colorado 1946

THELEN, HUBERT JOSEPH, 839 Carroll St., Brooklyn 15, New York 1947

M THOMAS, DR. EDWARD S[INCLAIR], Ohio State Museum, Columbus 10, Ohio (1922) 1941

THOMAS, EVAN GOWER, 3001 Dickinson St., Camp Hill, Pennsylvania 1952

THOMAS, GERALD B[AMBER], 5161 S. Western Ave., Los Angeles 62, California 1949

THOMAS, LANDON B., P. O. Box 141, Edgerton, Wisconsin 1947

THOMAS, RAY, 600 Sarbonne Rd., Los Angeles 24, California 1951

M THOMAS, RUTH HARRIS [MRS. ROWLAND], 410 E. Green St., Morrilton, Arkansas ..... (1935) 1950

THOMPSON, DANIEL Q[UALE], Wildlife Conservation Bldg., Columbia, Missouri 1949

THOMPSON, DAVID E[DGAR], Rt. 1, Leonard, North Dakota 1949

THOMPSON, JAMES D[ILLEY], JR., 509½ Polk St., Amarillo, Texas 1951

THOMPSON, PETER HEARNE, 10837—128th St., Edmonton, Alberta, Canada 1953

THOMPSON, WILLIAM LAY, Department of Zoology, University of California, Berkeley 4, California 1953

THOMSON, ISABEL A., 5939 Shafter Ave., Oakland 18, California 1952

THORLEY, ROBERT F., 3 Midland Gardens, Bronxville 8, New York 1947

THORNBURG, ASHLEY A[LVIN], 307 South Wheeler, Victoria, Texas 1950

L THORNE, OAKLEIGH, II, Box 347, Islip, Long Island, New York 1947

THORNTON, WILMOT A[RNOLD], 124 Washington St., So. Norwalk, Connecticut 1949

THORP, GEORGE B[OULTON], 1970 Massachusetts Ave., Lexington, Massachusetts 1935

THORSON, THOMAS B[ERTEL], Department of Zoology, San Francisco State College, San Francisco 2, California 1948
THURSTON, HENRY, Box 214, Montrose, New York 1947
TODD, H[ENRY] O[LIVER], JR., P. O. Box 259, 105 Spring St., Masonic Bldg., Murfreesboro, Tennessee 1939
F TODD, W[ALTER] E[DMOND] CLYDE, Carnegie Museum, Pittsburgh 13, Pennsylvania ..... (1890) 1916
TOMICH, P[ROSPER] QUENTIN, 204 Doroco Dr., Salinas, California 1945
M TOMKINS, IVAN REXFORD, 1231 E. 50th St., Savannah, Georgia ..... (1928) 1939
TOMPKINS, VICTOR N[ORMAN], 524 Madison Ave., Albany 3, New York ... 1949
TONER, GEORGE CLIVE, Highland Grove, Ontario, Canada 1948
M TORDOFF, DR. HARRISON B., Museum of Natural History, University of Kansas, Lawrence, Kansas ..... (1944) 1951
L TOUSEY, MISS KATHARINE, 22 Grand View Ave., Somerville 43, Massachusetts 1935
TOUSEY, DR. RICHARD, 6625 Oxon Hill Rd., S. E., Washington 21, D. C. .. 1943
TOWE, J[AY] TROY, Route 5, Box 143, Mt. Airy, North Carolina 1949
TOWNES, GEORGE F[RANKLIN], 500 Sumner St., Greenville, South Carolina 1953
TOWNSEND, DAVID CALDOW, Economics Department, University of Houston, Houston, Texas 1953
TOWNSEND, MISS ELSIE W., Department of Biology, Wayne University, Detroit 1, Michigan 1951
TRAINER, JOHN E[ZRA], Muhlenberg College, Department of Biology, Allentown, Pennsylvania 1937
TRASK, DR. PARKER DAVIES, 240 Southampton Ave., Berkeley 7, California 1936
M TRAUTMAN, DR. MILTON BERNARD, Stone Laboratory, Put-in-Bay, Ohio (1924) 1940
M TRAYLOR, MELVIN ALVAH, JR., 759 Burt Ave., Winnetka, Illinois .. (1940) 1950
TRIVETTE, EDWARD C[ARROLL], Department of Zoology, The State College of Washington, Pullman, Washington 1950
TROST, CHARLES HENRY, 3915 W. Lake Rd., Erie, Pennsylvania 1953
TROWERN, ROBERT WILSON, 42 Van Dusen Blvd., Toronto, Ontario, Canada 1947
TRYON, CLARENCE ARCHER, JR., Department of Biological Sciences, University of Pittsburgh, Pittsburgh 15, Pennsylvania 1947
L TUCKER, CARLL, Mt. Kisco, New York 1929
L TUCKER, MRS. CARLL, 733 Park Ave., New York, New York 1924
TUCKER, ROBERT E[DWARD], 245 N. Auburndale St., Memphis, Tenneessee 1944
TUCKER, MRS. ROBERT L., JR. [KATHARINE POISEL], 15 East St., Fairport, New York 1948
L TUFTS, DR. HAROLD F[REEMAN], Port Mouton, Queen's County, Nova Scotia, Canada 1947
TULINOFF, A[NTONINE], V., 1255 Wyoming Ave., Niagara Falls, New York 1949
TURNER, JAMES H[OWARD], 803 N. Wahsatch Ave., Colorado Springs, Colorado 1951
M TWOMEY, DR. ARTHUR C[ORNELIUS], Carnegie Museum, Pittsburgh, Pennsylvania ..... (1930) 1946
TYLER, BREWSTER, P[HILLIPS], 215 W. Unaka Ave., Johnson City, Tennessee 1934

TYLER, JOHN G[RIPPER], 1115 Thorn Ave., Fresno, California..... 1939
TYLER, MILDRED A[LLEN], 50 Morningside Park, Springfield 8, Massachusetts..... 1951
LF TYLER, DR. WINSOR MARRETT, Hotel Beaconsfield, Beacon St., Brookline 46, Massachusetts.....(1912) 1950
TYRRELL, W[ILLIAM] BRYANT, 246 Park Ave., Takoma Park 12, Maryland 1940
UDVARDY, DR. MIKLOS DEXSO FERENC, Department of Zoology, University of British Columbia, Vancouver, British Columbia..... 1953
M UHLER, FRANCIS M[OREY], Fish and Wildlife Service, Patuxent Research Refuge, Laurel, Maryland .....(1924) 1937
ULRICH, MRS. ALICE E., 193 LaSalle Ave., Buffalo, New York..... 1935
ULRICH, EDWARD C., 193 LaSalle Ave., Buffalo, New York..... 1935
L UNDERDOWN, HENRY T[ENER], 8216 Manor Rd., Elkins Park, Pennsylvania..... 1921
USSHER, R[ICHARD] D[AVEY], 101 Grandview Ave., Newtonbrook P. O., Ontario, Canada..... 1931
VAIDEN, M[EREDITH] GORDON, Box 248, Rosedale, Mississippi..... 1936
VAN ARSDALL, DR. C[HARLES] A[LEXANDER], 1024 Beaumont Ave., Harrodsburg, Kentucky..... 1949
VAN CLEVE, THOMAS C[URTIS], 76 Federal St., Brunswick, Maine..... 1951
VANDERMEER, B[ILLY] L[EE], 239 Paramount Ave., Salt Lake City, Utah.. 1951
VAN DEUSEN, HOBART MERRITT, 12 Highland Ave., Montclair, New Jersey 1937
VAN DYKE, TERTIUS, Avalon Cottage, Princeton, New Jersey..... 1930
VANESELTINE, WILLIAM PARKER, Department of Veterinary Hygiene, School of Veterinary Medicine, University of Georgia, Athens, Georgia..... 1944
L VANFLEET, CLARK C., Box 696, Lakeport, Lake County, California..... 1947
VAN HORN, DONALD H., 35 N. Ashland Ave., La Grange, Illinois..... 1952
VAN HUIZEN, PETER J., White River National Wildlife Refuge, St. Charles, Arkansas..... 1939
VAN IZIENDOORN, A[NTONIUS] L[AMBERTUS] J[OHAN], Korenmarkt 1, Hoorn, Holland..... 1950
HL VAN NAME, WILLARD GIBBS, American Museum of Natural History, Central Park West at 79th St., New York 24, New York..... 1900
VAN TYNE, DR. HELEN BATES [MRS. JOSSELYN], 405 Awixa Rd., Ann Arbor, Michigan..... 1950
LF VAN TYNE, DR. JOSSELYN, University of Michigan Museum of Zoology, Ann Arbor, Michigan.....(1922) 1936
VARNEY, B[ENJAMIN] EARL, 314 Maine St., Brunswick, Maine..... 1947
VAUGHAN, WILLIAM C[OLEMAN], Locust Grove Farm, River Road, Youngstown, New York..... 1935
M VAURIE, DR. [AUGUSTE JEAN] CHARLES, American Museum of Natural History, Central Park West at 79th St., New York 24, New York (1944) 1949
VERGES, EUGENE M[ARCELIN], II, 1126 Beacon St., Brookline, Massachusetts..... 1931
VERNON, DR. JAMES W[ILLIAM], Broadoaks Sanatorium, Morganton, North Carolina..... 1937
VITZ, PAUL C[LAYTON], 818 Dunore Rd., Cincinnati 20, Ohio..... 1951
M VOGT, WILLIAM W., 36 E. 68th St., New York 22, New York.....(1928) 1936

VOLLMAR, MRS. R[HEA] LEWIS, 6138 Simpson Ave., St. Louis 10, Missouri 1949
VON BLOEKER, JACK C[HRISTIAN], JR., Life Sciences Department, Los Angeles City College, Los Angeles 29, California 1941
VON DER HEYDT, JAMES A[RNOLD], P. O. Box 156, Nome, Alaska 1953
VONGLAHN, JOHN H[ERBERT], 204 Water St., New York 38, New York .. 1952
VORE, MARVIN E[LMER], 1128 N. 8th Ave., West Bend, Wisconsin 1949
WACHENFELD, MRS. WILLIAM A., 787 E. Clarke Pl., Orange, New Jersey .. 1953
WADE, DOUGLAS EDWARD, Wigington St., Clemson, South Carolina 1946
WADE, JOSEPH SANFORD, Argonne Apts., 1629 Columbia Rd., N. W., Washington 9, D. C. 1929
WAGNER, MRS. C[ARY] R[ICHARD], South Lane Farm, Utica, Ohio 1950
WAGNER, MRS. EDNA R[OBISON], 5115 Cass, Omaha 3, Nebraska 1951
WAGNER, MRS. JULIA E[LIZABETH], 818 E. Boulder St., Colorado Springs, Colorado 1949
WAINWRIGHT, C[ARROLL] L[IVINGSTON], JR., One East End Ave., New York 21, New York 1950
WALCOTT, DR. CHARLES F., 81 Sparks St., Cambridge 38, Massachusetts . 1952
WALCOTT, ROBERT, 912 Barristers Hall, Pemberton Square, Boston, Massachusetts 1924
WALDBAUER, GILBERT PETER, 337 Benham Ave., Bridgeport, Connecticut 1945
L WALGREEN, MRS. CHARLES R., 3240 Lake Shore Dr., Chicago 13, Illinois 1951
WALKER, ALAN N[EWTON], 15480 Holmur, Detroit 21, Michigan 1952
M WALKER, DR. CHARLES F[REDERICK], Museum of Zoology, University of Michigan, Ann Arbor, Michigan ..... (1927) 1944
WALKER, JASON A[LISON], 89 Church St., Waterloo, New York 1948
WALKER, MRS. RICHARD D[EXTER], 78 Farlow Rd., Newton 58, Massachusetts 1953
WALKER, DR. ROLAND, Rensselaer Polytechnic Institute, Biological Laboratory, Troy, New York 1924
LF WALKINSHAW, DR. LAWRENCE H[ARVEY], 1703 Wolverine Tower, Battle Creek, Michigan ..... (1929) 1951
M WALLACE, DR. GEORGE J[OHN], 517 Ann St., East Lansing, Michigan (1935) 1945
WALLACE, ROY FREDERICK, 63 Dupont St., Toronto, Ontario, Canada 1947
WALLER, SAM[UEL], Indian School, The Pas, Manitoba, Canada 1949
WALLMO, OLOF CHARLES, Box 254 F.E., College Station, Texas 1953
WALTER, CEDRIC N[ORMAN], 32 Stanley Ave., Beckenham, Kent, England 1948
WALTER, MRS. HERBERT EUGENE [ALICE E.], 67 Oriole Ave., Providence 6, Rhode Island 1938
WALTERS, FRANK, Hollis, New Hampshire 1902
WALTHO, E., 140 Balliol St., Toronto 12, Ontario, Canada 1952
WANAMAKER, JOHN, Principia College, Elsah, Illinois 1946
WANEK, MRS. ERNEST E. [ANNA N.], 5 Davidson Ave., Ramsey, New Jersey 1953
WANG, DR. YANG, Massachusetts General Hospital, Boston 14, Massachusetts 1953
WANLESS, HAROLD R., 127 Natural History Bldg., University of Illinois, Urbana, Illinois 1947
WANZER, JAMES OLIN, 3601—56th St., Sacramento 20, California 1947
WARD, ARTHUR, 375—7th East, Swift Current, Saskatchewan, Canada ... 1950

WARD, CHARLES L[AKEMAN], JR., 15 Monument St., Concord, Massachusetts 1950
WARFIELD, BEN[JAMIN] BRECKINRIDGE, 3223 Volta Pl., N. W., Washington 7, D. C. 1930
WARHAM, JOHN, c/o Mrs. E. A. James, "Corynia," Upper Kalgan River, Albany, W. Australia 1952
WARING, JOHN D., Anzac, Alberta, Canada 1953
M WARNER, DR. DWAIN W., Museum of Natural History, University of Minnesota, Minneapolis 14, Minnesota ..... (1942) 1951
WARTERS, MISS MARY ELLEN, 5115 Woodland Ave., Des Moines 12, Iowa 1951
WASHINGTON, MRS. WHITING, Trail's End, North Edgecomb, Maine 1947
WASS, MARVIN F., Mullet Key, Pass-a-grille, Florida 1952
WASSERFALL, WILLIAM, 22 Roycrest Ave., Lansing, Ontario, Canada 1952
WATERMAN, RALPH T[EN EYCK], Meadow Rd., Poughkeepsie, New York 1947
WATSON, C[HARLES] G[RAY], 201 Ridout St., S., London, Ontario, Canada 1919
WATSON, CHARLES NELLES, JR., 421 Wolf's Lane, Pelham Manor 65, New York 1952
WATSON, FRANK G[RAHAM], 4110 Drummond St., Houston 25, Texas 1936
WATSON, ROBERT J., Box 75, Blacksburg, Virginia 1947
WAYLAND-SMITH, ROBERT, 137 Kenwood Ave., Oneida, New York 1953
WEART, MISS EDITH L[UCIE], 35–36 76th St., Jackson Heights, New York 1946
WEAVER, JACK F[REDERICK], Providence Rd., Box 20C, R. F. D. 6, Towson 4, Maryland 1949
WEAVER, MISS MADELINE M[ARY], 161 Norton St., Rochester 21, New York 1953
WEBER, FREDERICK JULES, East End Cottage, Rockerfeller Refuge, Grand Chenier, Louisiana 1953
WEBER, JAY A[NTHONY], 1400 N. E. 108th St., Miami 38, Florida 1907
WEBSTER, CLARK G[IBBONS], Patuxent Research Refuge, Laurel, Maryland 1948
WEBSTER, HARRY REID, Room 433, Post Office Bldg., Edmonton, Alberta, Canada 1949
WEBSTER, DR. J[ACKSON] DAN, Hanover College, Hanover, Indiana 1941
WEBSTER, KARL B[LISS], 57 Webster Park Ave., Columbus 2, Ohio 1949
WEBSTER, RANDALL, 341 Western Ave., Brookville, Pennsylvania 1937
WEEKS, MANGUM, 219 N. Royal St., Alexandria, Virginia 1938
WEISE, CHARLES M[ARTIN], Vivarium Bldg., University of Illinois, Urbana, Illinois 1948
WEISER, CHARLES S[PANGLER], Wyndham Hills, York, Pennsylvania 1916
WEISER, VIRGIL LEONARD, 538 W. Villard, Dickinson, North Dakota 1947
WELLER, MILTON W[EBSTER], Wildlife Cons. Bldg., Columbia, Missouri .. 1952
L WELLING, YENS M., 1828 E. 5th St., Anderson, Indiana 1924
WELLINGS, S[EFTON] R[OBERT], P. O. Box 518, Poulsbo, Washington 1949
WELLS, LARUE, 212 W. Hewitt, Marquette, Michigan 1952
WELTY, [JOEL] CARL, R. 1, Beloit, Wisconsin 1948
WENDT, LORINA M., 3701 Jenifer St., N. W., Washington 15, D. C. 1946
WERNER, RAY C[OWLES], 758 Wildwood Rd., N. E., Atlanta, Georgia 1947
WERNER, MRS. TYRRELL H., 100 Tolman St., Cumberland Mills, Maine .. 1952
WERNICKE, MRS. J. F. [MALETA MOORE], Gull Point, Escambia Co., Florida 1946
WESSELING, KURT [PAUL], JR., 243 Orrick Lane, Kirkwood 22, Missouri .. 1949

WEST, MRS. E[UGENE] M., [ADELE H(OOKER)], 1625-S Clayton Ave., Chattanooga 4, Tennessee 1951
WEST, GEORGE C[URTISS], 56 Tyler Terrace, Newton Center 59, Massachusetts 1951
WEST, HENRY C[LOPTON], 5820 Crittenden Ave., Indianapolis 21, Indiana 1950
WEST, JULIUS DAVID, 373 Marf Ave., Lakeview, Ontario, Canada 1947
M WESTON, FRANCIS MARION, 2006 E. Jordan St., Pensacola, Florida..(1925) 1933
WESTON, HENRY G[RIGGS], JR., Department of Biology, Grinnell College, Grinnell, Iowa 1943
WESTON, ROBERT, Old Ferry Road, North Castine, Maine 1946
WETHERBEE, DAVID KENNETH, 11 Dallas St., Worcester, Massachusetts.. 1945
WETHERBEE, MRS. KENNETH B[RACKETT], 11 Dallas St., Worcester, Massachusetts 1929
LF WETMORE, DR. ALEXANDER, Smithsonian Institution, Washington 25, D. C. ..... (1908) 1919
WEYDEMEYER, WINTON [WILLIAM], Fortine, Montana 1925
WEYL, EDWARD S[TERN], 3827 The Oak Road, Philadelphia 29, Pennsylvania 1921
L WHARTON, WILLIAM PICKMAN, Groton, Massachusetts 1907
WHEATLAND, MISS SARAH B[IGELOW], 99 Howe St., New Haven, Connecticut 1951
WHELAN, MARY-ELIZABETH, 215 Catherine, Muskegon, Michigan 1951
WHIGHAM, MRS. ANDREW L[EE], P. O. Box 235, Century, Florida 1939
WHITAKER, JAMES LONG, Adams Ave. and Tabor Rd., Philadelphia 20, Pennsylvania 1946
WHITAKER, MRS. LOVIE M., 1204 W. Brooks St., Norman, Oklahoma 1952
WHITCOMB, PEMBERTON, 130 Cedar St., New York 6, New York 1948
WHITE, DR. GORDON B[RAINERD], 239 Sugar Loaf St., Port Colborne, Ontario, Canada 1949
WHITE, KEITH L[YNDE], Eldorado, Wisconsin 1951
WHITING, ROBERT A[RCHIE], 2521 Cobb Rd., Jackson, Michigan 1949
WHITMAN, F[RANK] BURTON, JR., MerePoint Rd., Brunswick, Maine 1951
WHITNEY, DR. NATHANIEL RUGGLES, JR., 20 Oak St., Glendale, Ohio 1947
WHITTLES, DR. LEE JAY, 2205 Main St., Glastonbury, Connecticut 1951
WICKE, A[LFRED] F[REDERICK], JR., 1515 N. "A" St., Pensacola, Florida.. 1949
WICKS, MRS. JUDSON L. [GERTRUDE PERROTT], 2615 Park Ave., Apt. 407, Minneapolis 7, Minnesota 1922
WICKSTROM, GEORGE M[ARTIN], 2293 Harding Ave., Muskegon, Michigan 1951
WIEBUSH, JOSEPH ROY, 3113 Lancer Dr., Hyattsville, Maryland 1952
WIEDEL, DR. PHILIP D[RESSLER], 1030 Fifth Ave., New York 38, New York 1950
WILCOX, DR. HARRY H[AMMOND], JR., 769 University St., Memphis 7, Tennessee 1938
WILCOX, STEPHEN LEROY, Speonk, Long Island, New York 1927
HL WILCOX, THOMAS FERDINAND, Smith Ridge, New Canaan, Connecticut, 1895
WILDER, T[HEODORE] G[ARFIELD], 125 Oxford Rd., Waukesha, Wisconsin.. 1946
WILES, DR. HAROLD O[LIVER], 537 Campbell Ave., Kalamazoo, Michigan 1939
WILHELM, EUGENE J., JR., 4725 Lee Ave., St. Louis 15, Missouri 1953
WILK, ALBERT L[AWRENCE], R. R. No. 2, Camrose, Alberta, Canada 1936
M WILLIAMS, C[ECIL] S[LOAN], Fish and Wildlife Service, Department of the Interior, Washington 25, D. C. ..... (1937) 1950

WILLIAMS, CLETIS, Poultry Department, University of Wisconsin, Madison, Wisconsin 1953
WILLIAMS, EDWARD A[LEXANDER], 1415 Pullan Ave., Cincinnati 23, Ohio 1950
WILLIAMS, ELLISON A[DGER], 27 Limehouse St., Charleston, South Carolina 1923
WILLIAMS, MRS. ELMA F., Box 293, Aurora, Ontario, Canada 1952
M WILLIAMS, GEORGE G., The Rice Institute, Houston 1, Texas ..... (1944) 1952
WILLIAMS, HELEN J[ACKSON], Arlington Towers, 129 North Arlington Ave., Apt. 4T, East Orange, New Jersey 1950
M WILLIAMS, LAIDLAW [ONDERDONK], R. F. D., Route 1, Box 152, Carmel, California ..... (1919) 1949
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WILLIAMSON, FRANCIS S[IDNEY] L[ANIER], Museum of Vertebrate Zoology, Berkeley, California 1949
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L WINEMAN, ANDREW, 150 Michigan Ave., Detroit 26, Michigan 1932
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M WING, DR. LEONARD W[ILLIAM], R. F. D. 1, East Brady, Pennsylvania (1929) 1945
WINGATE, DAVID B[ALCOMBE], Aldie, Smith's Parish, Bermuda 1951
WINN, H[OWARD] ELLIOTT, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 1946
WINN, DR. HUDSON S[UMNER], Department of Biology, New York State College for Teachers, Albany 3, New York 1949
M WITSCHI, DR. EMIL, University of Iowa, Iowa City, Iowa ..... (1939) 1946
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F WOLFSON, DR. ALBERT, Northwestern University, Evanston, Illinois (1941) 1952

WOLK, ROBERT G[EORGE], Laboratory of Ornithology, Cornell University, Ithaca, New York 1952
WOOD, CHARLES, 159 Summit St., East Providence 14, Rhode Island 1950
WOOD, DALE T[HACKER], 636 Cortez Ave., Vista, California 1949
WOOD, DR. HAROLD BACON, 3016 N. Second St., Harrisburg, Pennsylvania 1929
WOOD, MERRILL, Zoology Department, Pennsylvania State College, State College, Pennsylvania 1927
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M WOODBURY, DR. ANGUS MUNN, 248 University St., Salt Lake City 2, Utah (1942) 1950
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WRIGHT, A[LBERT] J[AY], 2ND, c/o J. S. Bache & Co., Ellicott Square, Buffalo, New York 1940
L WRIGHT, BRUCE S[TANLEY], Northeastern Wildlife Station, University of New Brunswick, Fredericton, New Brunswick, Canada 1946
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WYATT, GRACE, College Station, Murray, Kentucky 1949
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LM WYNNE-EDWARDS, V[ERO] C[OPNER], Natural History Department, Marischal College, University of Aberdeen, Aberdeen, Scotland .. (1930) 1936
YATSUHASHI, DR. MASAO, 66 Beals St., Brookline 46, Massachusetts 1941
YEATMAN, HARRY C[LAY], Department of Biology, University of the South, Sewanee, Tennessee 1947
M YEATTER, DR. RALPH EMERSON, Illinois State Natural History Survey, Urbana, Illinois ..... (1926) 1948
YOCOM, DR. CHARLES F[REDERICK], Game Management Department, Humboldt State College, Arcata, California 1947
YOHE, WALTER E[DWIN], 688 Cherry St., Columbia, Pennsylvania 1949
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ZUILL, CHARLES VINCENT, Smith's Parish, Bermuda..... 1953
ZULOAGA, DR. GUILLERMO, Creole Petroleum Corporation, Apartado 889, Caracas, Venezuela, South America..... 1951

MAURICE BROUN
has more than 30 years' experience as a naturalist, with principal activities in conservation and the development of wildlife sanctuaries in five states. He is recipient of a D.Sc. from Muhlenberg College, in 1952, for achievements in conservation. Author of *"Hawks Aloft,"* in which he tells of his pioneer work at Hawk Mountain Sanctuary, and of the *"Index to North American Ferns."*

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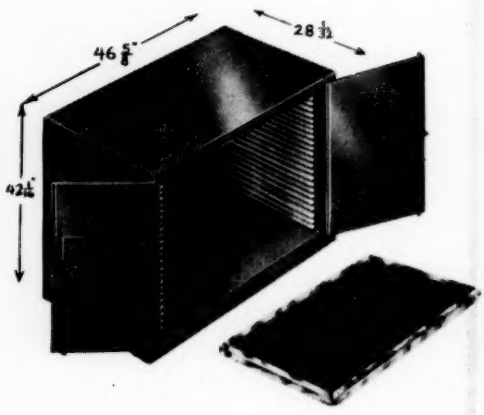

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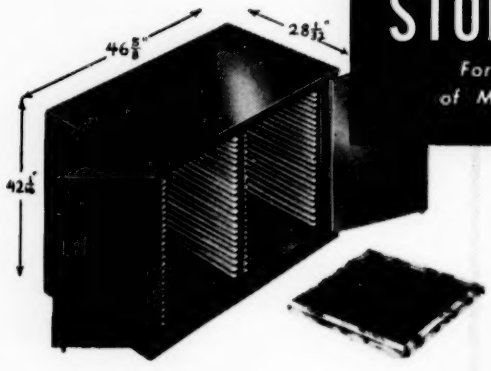

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